

**DRAFT**

**CPA STANDARD**

**FOR**

**POULTRY FEEDS**

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**This is a draft and should not be regarded  
or used as a CARICOM Standard**

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Date Circulated for Comments: 2005-00-00  
Last Date for Comments :

## 0. FOREWORD

0.1 This standard was developed as an initiative of the Caribbean Poultry Association in response to the need to harmonise standards for the production and use of poultry feeds within CARICOM. Representatives of several national associations and standards bureaus were involved in the discussions leading to the elaboration of the standard.

0.2 This standard is designed to:

- (a) ensure that poultry animals, used either as poultry meat or for the production of eggs used for human food, are fed rations, which are appropriate for the category of bird;
- (b) help ensure the safety of food for human consumption through adherence to good poultry feeding practice at the farm level and good manufacturing practices during the procurement, handling, storage, processing and distribution of poultry feed and feed ingredients

## 1. SCOPE

1.1 This standard establishes specifications for nutrient requirements in the rations fed to poultry animals. It provides guidance on good manufacturing practices for the production of poultry feeds and good on-farm feeding practices. It applies to the production and use of all materials designed for poultry feed and feed ingredients at all levels, whether produced industrially or on farm.

## 2. DEFINITIONS

2.1 Broiler Starter Ration means animal feed fed to broilers 0 weeks to 6 weeks of age.

2.2 Broiler Finisher Ration means animal feed fed to broilers 6 week to 8 weeks of age.

2.3 Broiler Ration means animal feed fed to broilers 0 week to 8 weeks of age.

2.4 Pullet Starter Ration means animal feed fed to replacement pullets, egg or meat type, 0 week to 6 weeks of age.

- 2.5            Pullet Grower Ration means animal feed fed to replacement pullets, egg or meat type, 6 weeks to 14 weeks of age.
- 2.6            Pullet Developer Ration means animal feed fed to pullets, egg or meat type, 14 weeks to 20 weeks of age.
- 2.7            Turkey Pre-starter Ration means animal feed fed to turkey poults, 0 week to 4 weeks of age.
- 2.8            Turkey Starter Ration means animal feed fed to turkey poults, 4 weeks to 8 weeks of age.
- 2.9            Turkey Grower Ration means animal feed fed to growing turkeys, 8 weeks to 20 weeks of age.
- 2.10           Turkey Breeding Ration means animal feed fed to turkeys over 20 weeks of age.
- 2.11           Poultry Feed (Feedingstuff) means any single or multiple material whether processed, semi-processed or raw, which is intended to be fed directly to poultry animals.
- 2.12           Feed Ingredient means a component part or constituent of any combination or mixture making up a feed, whether or not it has a nutritional value in the animal's diet, including feed additives. Ingredients are of plant, animal or aquatic origin, or other organic or inorganic substances.
- 2.13           Feed Additive mean any intentionally added ingredient not normally consumed as feed by itself, whether or not it has a nutritional value, which affects the characteristics of feed or animal products.
- 2.14           Medicated Feed means any feed, which contains veterinary drugs as defined in the Codex Alimentarius Commission Procedural Manual.
- 2.15           Undesirable Substances mean contaminants and other substances, which are present in and/or on feed and feed ingredients and which constitute a risk to the health of consumers, including food safety related animal health issues.

### 3.            NUTRIENT REQUIREMENTS

**Table 1 Nutrient Requirements, Broiler**

Metabolizable energy is 3200 kcal/kg = 13.397.76 kJ/kg

	BROILER STARTER RATION				BROILER FINISHER RATION				BROILER RATION			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU
Minimum crude protein	23	-	-	-	18	-	-	-	20	-	-	-
Minimum crude fat	5	-	-	-	5	-	-	-	5	-	-	-
Maximum crude fibre	4.5	-	-	-	4.5	-	-	-	4.5	-	-	-
<b>Minimum amino acid requirements in amt. per kg of dry matter</b>												
Arginine	1.44	14 400	-	-	1.00	10 000	-	-	1.20	12 000	-	-
Glycine and/or Serine	1.50	15 000	-	-	0.70	7 000	-	-	1.00	10 000	-	-
Histidine	0.35	3 500	-	-	0.26	2 600	-	-	0.30	3 000	-	-
Isoleucine	0.80	8 000	-	-	0.60	6 000	-	-	0.70	7 000	-	-
Leucine	1.35	13 500	-	-	1.00	10 000	-	-	1.18	11 800	-	-
Lycine	1.20	12 000	-	-	0.85	8 500	-	-	1.00	10 000	-	-
Methionine + Cystine	0.93	9 000	-	-	0.60	6 000	-	-	0.72	7 200	-	-
Methionine	0.50	5 000	-	-	0.32	3 200	-	-	0.38	3 800	-	-
Phenylalanine + Tyrosine	1.34	13 400	-	-	1.00	10 000	-	-	1.17	11 700	-	-
Phenylalanine	0.72	7 200	-	-	0.54	5 400	-	-	0.63	6 300	-	-
Threonine	0.80	8 000	-	-	0.68	6 800	-	-	0.74	7 400	-	-
Tryptophan	0.23	2 300	-	-	0.17	1 700	-	-	0.18	1 800	-	-
Valine	0.82	8 200	-	-	0.62	6 200	-	-	0.72	7 200	-	-
Linoleic acid	1.00	10 000	-	-	1.00	10 000	-	-	1.00	10 000	-	-

Table 2. Nutrient Requirements, Broiler

Metabolizable energy is 2900 kcal/kg = 12 141.72 kJ/kg

	BROILER STARTER RATION				BROILER FINISHER RATION				BROILER RATION			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU
<b>Minimum vitamin and mineral requirements in amt per kg feed</b>												
Vitamin A	-	-	-	1	-	-	-	1 500	-	-	-	1 500
Vitamin D	-	-	200	500	-	-	200	-	-	-	200	-
Vitamin E	-	-	-	-	-	-	-	10	-	-	-	10
Vitamin K	-	0.50	-	10	-	0.50	-	-	-	0.50	-	-
Thaimine	-	1.80	-	-	-	1.80	-	-	-	1.80	-	-
Riboflavin	-	3.60	-	-	-	3.60	-	-	-	3.60	-	-
Pantothenic acid	-	10	-	-	-	10	-	-	-	10	-	-
Niacin	-	27	-	-	-	11	-	-	-	27	-	-
Pyridoxine	-	3	-	-	-	2.50	-	-	-	3	-	-
Biotin	-	0.15	-	-	-	0.10	-	-	-	0.15	-	-
Choline	-	1 300	-	-	-	500	-	-	-	850	-	-
Folacin (starch diet)	-	0.55	-	-	-	0.25	-	-	-	0.55	-	-
Folacin (sugar diet)	-	-	-	-	-	-	-	-	-	-	-	-
Vitamin B	-	0.009	-	-	-	0.003	-	-	-	0.009	-	-
Calcium	1.00	10 000	-	-	0.80	8 000	-	-	0.9	9 000	-	-
Phosphorus, available	0.45	4 500	-	-	0.35	3 500	-	-	0.4	4 000	-	-
Phosphorus	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	0.15	1 500	-	-	0.15	1 500	-	-	0.15	1 500	-	-
Chlorine	0.15	1 500	-	-	0.15	1 500	-	-	0.15	1 500	-	-
Potassium	0.40	4 000	-	-	0.30	3 000	-	-	0.35	3 500	-	-
Magnesium	-	60	-	-	-	60	-	-	-	60	-	-
Iodine	-	0.35	-	-	-	0.35	-	-	-	0.35	-	-
Magnesium	-	600	-	-	-	600	-	-	-	600	-	-
Iron	-	80	-	-	-	80	-	-	-	80	-	-
Copper	-	8	-	-	-	8	-	-	-	8	-	-
Zinc	-	40	-	-	-	40	-	-	-	40	-	-
Selenium	-	0.15	-	-	-	0.15	-	-	-	0.15	-	-

Table 3. Nutrient Requirements, Pullet

Metabolizable energy is 3200 kcal/kg = 13 397.76 kJ/kg

	PULLET STARTER RATION				PULLET GROWER RATION				PULLET DEVELOPER RATION			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	Mg/kg	ICU	IU
Minimum crude protein	18	-	-	-	15	-	-	-	12	-	-	-
Minimum crude fat	3	-	-	-	3	-	-	-	3	-	-	-
Maximum crude fibre	6	-	-	-	16	-	-	-	7	-	-	-
<b>Minimum amino acid requirements in amt. per kg of dry matter</b>												
Arginine	1.00	10 000	-	-	0.83	8 300	-	-	0.67	6 700	-	-
Glycine and/or Serine	0.70	7 000	-	-	0.58	5 800	-	-	0.47	4 700	-	-
Histidine	0.26	2 600	-	-	0.22	2 200	-	-	0.17	1 700	-	-
Isoleucine	0.60	6 000	-	-	0.50	5 000	-	-	0.40	4 000	-	-
Leucine	1.00	10 000	-	-	0.83	8 300	-	-	0.67	6 700	-	-
Lycine	0.85	8 500	-	-	0.60	6 000	-	-	0.45	4 500	-	-
Methoinine + Cystine	0.60	6 000	-	-	0.50	5 000	-	-	0.40	4 000	-	-
Methionine	0.30	3 000	-	-	0.25	2 500	-	-	0.20	2 000	-	-
Phenylalanine + Tyrosine	1.00	10 000	-	-	0.83	8 300	-	-	0.67	6 700	-	-
Phenylalanine	0.54	5 400	-	-	0.45	4 500	-	-	0.36	3 600	-	-
Threonine	0.68	6 800	-	-	0.57	5 700	-	-	0.37	3 700	-	-
Tryptophan	0.17	1 700	-	-	0.14	1 400	-	-	0.11	1 100	-	-
Valine	0.62	6 200	-	-	0.52	5 200	-	-	0.41	4 100	-	-
Linoleic acid	1.00	10 000	-	-	1.00	10 000	-	-	1.00	10 000	-	-

Table 4. Nutrient requirements, Pullet

Metabolizable energy is 3200 kcal/kg = 13 397.76 kJ/kg

	Pullet Starter Ration				Pullet Grower Ration				Pullet Developer Ration			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU
<b>Minimum vitamin and mineral requirements in amt per kg feed</b>												
Vitamin A	-	-	-	1 500	-	-	-	1 500	-	-	-	1 500
Vitamin D	-	-	200	-	-	-	200	-	-	-	200	-
Vitamin E	-	-	-	10	-	-	-	5	-	-	-	5
Vitamin K	-	0.50	-	-	-	0.50	-	-	-	0.50	-	-
Thaimine	-	1.80	-	-	-	1.30	-	-	-	1.30	-	-
Riboflavin	-	3.60	-	-	-	1.80	-	-	-	1.80	-	-
Pantothenic acid	-	10	-	-	-	10	-	-	-	10	-	-
Niacin	-	27	-	-	-	11	-	-	-	11	-	-
Pyridoxine	-	3.00	-	-	-	3.00	-	-	-	3.00	-	-
Biotin	-	0.15	-	-	-	0.10	-	-	-	0.10	-	-
Choline	-	1 300	-	-	-	900	-	-	-	500	-	-
Folacin (starch diet)	-	0.55	-	-	-	0.25	-	-	-	0.25	-	-
Folacin (sugar diet)	-	-	-	-	-	-	-	-	-	-	-	-
Vitamin B	-	0.009	-	-	-	0.003	-	-	-	0.003	-	-
Calcium	0.80	8 000	-	-	0.70	7 000	-	-	0.60	6 000	-	-
Phosphorus, available	0.40	4 000	-	-	0.35	3 500	-	-	0.30	3 000	-	-
Phosphorus	0.70	7 000	-	-	0.40	4 000	-	-	0.40	4 000	-	-
Sodium	0.15	1 500	-	-	0.15	1 500	-	-	0.15	1 500	-	-
Chlorine	0.15	1 500	-	-	0.12	1 200	-	-	0.12	1 200	-	-
Potassium	0.40	4 000	-	-	0.30	3 000	-	-	0.25	2 500	-	-
Magnesium	-	60	-	-	-	30	-	-	-	30	-	-
Iodine	-	0.35	-	-	-	0.35	-	-	-	0.35	-	-
Magnesium	-	600	-	-	-	500	-	-	-	400	-	-
Iron	-	80	-	-	-	60	-	-	-	60	-	-
Copper	-	8.00	-	-	-	6	-	-	-	6	-	-
Zinc	-	40.00	-	-	-	35	-	-	-	35	-	-
Selenium	-	0.15	-	-	-	0.10	-	-	-	0.10	-	-

Table 5. Nutrient Requirements, Turkey

Metabolizable energy is 3200 kcal/kg = 13 397.76 kJ/kg

	TURKEY PRE-STARTER RATION				TURKEY STARTER RATION				TURKEY GROWER RATION			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU
Minimum crude protein	28	-	-	-	26	-	-	-	22	-	-	-
Minimum crude fat	-	-	-	-	3	-	-	-	-	-	-	-
Maximum crude fibre	-	-	-	-	6.50	-	-	-	-	-	-	-
<b>Minimum amino acid requirements in amt. per kg of dry matter</b>												
Arginine	1.60	16 000	-	-	1.50	15 000	-	-	1.25	-	-	-
Glycine and/or Serine	1.00	10 000	-	-	0.90	9 000	-	-	0.80	-	-	-
Histidine	0.58	5 800	-	-	0.54	5 400	-	-	0.46	-	-	-
Isoleucine	1.10	11 000	-	-	1.00	10 000	-	-	0.85	-	-	-
Leucine	1.90	19 000	-	-	1.75	17 500	-	-	1.50	-	-	-
Lycine	1.60	16 000	-	-	1.50	15 500	-	-	1.30	-	-	-
Methionine + Cystine	1.05	10 500	-	-	0.90	9 000	-	-	0.75	-	-	-
Methionine	0.53	5 300	-	-	0.45	4 500	-	-	0.38	-	-	-
Phenylalanine + Tyrosine	1.80	18 000	-	-	1.65	16 500	-	-	1.40	-	-	-
Phenylalanine	1.00	10 000	-	-	0.90	9 000	-	-	0.80	-	-	-
Threonine	1.00	10 000	-	-	0.93	9 300	-	-	0.79	-	-	-
Tryptophan	0.26	2 600	-	-	0.24	2 400	-	-	0.20	-	-	-
Valine	1.20	12 000	-	-	1.1	11 000	-	-	0.94	-	-	-
Linoleic acid	1.00	10 000	-	-	1.0	10 000	-	-	0.80	-	-	-

Table 6. Nutrient Requirements, Turkey

Metabolizable energy is 3200 kcal/kg = 13 397.76 kJ/kg

	TURKEY PRE-STARTER RATION				TURKEY STARTER RATION				TURKEY GROWER RATION			
	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU	%	mg/kg	ICU	IU
<b>Minimum vitamin and mineral requirements in amt per kg feed</b>												
Vitamin A	-	-	-	4 000	-	-	-	4 000	-	-	-	4 000
Vitamin D	-	-	900	-	-	-	900	-	-	-	900	-
Vitamin E	-	-	-	12	-	-	-	12	-	-	-	10
Vitamin K	-	1	-	-	-	1	-	-	-	0.8	-	-
Thaimine	-	2	-	-	-	2	-	-	-	2	-	-
Riboflavin	-	3.6	-	-	-	3.6	-	-	-	3	-	-
Pantothenic acid	-	11	-	-	-	11	-	-	-	9	-	-
Niacin	-	70	-	-	-	70	-	-	-	50	-	-
Pyridoxine	-	4.5	-	-	-	4.5	-	-	-	3.50	-	-
Biotin	-	0.2	-	-	-	0.2	-	-	-	0.15	-	-
Choline	-	1 900	-	-	-	1 600	-	-	-	1 300	-	-
Folacin (starch diet)	-	1.0	-	-	-	1	-	-	-	0.8	-	-
Folacin (sugar diet)	-	-	-	-	-	-	-	-	-	-	-	-
Vitamin B	-	0.003	-	-	-	0.003	-	-	-	0.003	-	-
Calcium	1.20	12 000	-	-	1.00	10 000	-	-	0.85	8 500	-	-
Phosphorus, available	0.60	6 000	-	-	0.50	5 000	-	-	0.42	4 200	-	-
Phosphorus	-	-	-	-	0.80	8 000	-	-	0.70	7 000	-	-
Sodium	0.17	1 700	-	-	0.15	1 500	-	-	0.12	1 200	-	-
Chlorine	0.15	1 500	-	-	0.14	1 400	-	-	0.14	1 400	-	-
Potassium	0.70	7 000	-	-	0.60	6 000	-	-	0.50	5 000	-	-
Magnesium	-	60	-	-	-	60	-	-	-	60	-	-
Iodine	-	0.4	-	-	-	0.4	-	-	-	0.4	-	-
Magnesium	-	600	-	-	-	600	-	-	-	600	-	-
Iron	-	80	-	-	-	60	-	-	-	60	-	-
Copper	-	8	-	-	-	8	-	-	-	6	-	-
Zinc	-	75	-	-	-	65	-	-	-	50	-	-
Selenium	-	0.2	-	-	-	0.2	-	-	-	0.2	-	-

**Table 7. Nutrient Requirements, Turkey**

Metabolizable energy is 3200 kcal/kg = 13 397.76 kJ/kg

	<b>Turkey Breeding Ration</b>			
	%	mg/kg	ICU	IU
Minimum crude protein	14	-	-	-
Minimum crude fat	3	-	-	-
Maximum crude fibre	7.5	-	-	-
<b>Minimum amino acid requirements in amt. per kg of dry matter</b>				
Arginine	0.60	6 000	-	-
Glycine and/or Serine	0.50	5 000	-	-
Histidine	0.30	3 000	-	-
Isoleucine	0.50	5 000	-	-
Leucine	0.50	5 000	-	-
Lycine	0.60	6 000	-	-
Methoinine + Cystine	0.40	4 000	-	-
Methionine	0.20	2 000	-	-
Phenylalanine + Tyrosine	1.00	10 000	-	-
Phenylalanine	0.55	5 500	-	-
Threonine	0.45	4 500	-	-
Tryptophan	0.13	1 300	-	-
Valine	0.58	5 800	-	-
Linoleic acid	1.00	10 000	-	-

	Turkey Pre-Starter Ration			
	%	mg/kg	ICU	IU
<b>Minimum vitamin and mineral requirements in amt per kg feed</b>				
Vitamin A	-	-	-	4 000
Vitamin D	-	-	900	-
Vitamin E	-	-	-	25
Vitamin K	-	1	-	-
Thaimine	-	2	-	-
Riboflavin	-	4	-	-
Pantothenic acid	-	16	-	-
Niacin	-	30	-	-
Pyridoxine	-	4	-	-
Biotin	-	0.15	-	-
Choline	-	1 000	-	-
Folacin (starch diet)	-	1	-	-
Folacin (sugar diet)	-	-	-	-
Vitamin B	-	0.003	-	-
Calcium	2.25	22 500	-	-
Phosphorus, available	0.35	3 500	-	-
Phosphorus	0.75	7 500	-	-
Sodium	0.15	1 500	-	-
Chlorine	0.12	1 200	-	-
Potassium	0.6	6 000	-	-
Magnesium	-	60	-	-
Iodine	-	0.4	-	-
Magnesium	-	600	-	-
Iron	-	60	-	-
Copper	-	8	-	-
Zinc	-	65	-	-
Selenium	-	0.2	-	-

#### 4. GENERAL PRINCIPLES AND REQUIREMENTS

Feed and feed ingredients should be obtained and maintained in a stable condition so as to protect feed and feed ingredients from contamination by pests, or by chemical, physical or microbiological contaminants or other objectionable substances during production, handling, storage and transport. Feeds should be in good condition and meet generally accepted quality standards. Where appropriate, good agricultural practices, good manufacturing practices (GMPs) and, where applicable, Hazard Analysis and Critical Control Point (HACCP) principles should be followed to control hazards that may occur in food. Potential sources of contamination from the environment should be considered.

Entities that produce feed or feed ingredients, those that rear animals for use as food and those that produce such animal products need to collaborate to identify potential hazards and their levels of risk to consumers' health. Such collaboration will enable the development and maintenance of appropriate risk management options and safe feeding practices.

##### 4.1 Feed Ingredients

Feed ingredients should be obtained from safe sources and be subjected to a risk analysis where the ingredients are derived from processes and/or technologies not hitherto evaluated from a food safety point of view. The procedure used should be consistent with the Working Principles for Risk Analysis for Application in the Framework of the Codex Alimentarius. Manufacturers of feed additives in particular should provide clear information to the user to permit correct and safe use. Monitoring of feed ingredients should include inspection and sampling and analysis for undesirable substances using risk-based protocols. Feed ingredients should meet acceptable and, if applicable, statutory standards for levels of pathogens, mycotoxins, pesticides and undesirable substances that may give rise to consumers' health hazards.

##### 4.2 Labelling

Labelling should be clear and informative as to how the user should handle, store and use feed and feed ingredients. Labelling should be consistent with any statutory requirements and should describe the feed and provide instructions for use. Labelling or the accompanying documents should contain, where appropriate:

- country of origin of the feed
- information about the species or category of animals for which the feed is intended;

- the purpose for which the feed is intended;
- a list of feed ingredients, including appropriate reference to additives, in descending order of production;
- contact information of manufacturer or registrant;
- registration number if applicable;
- directions and precautions for use;
- lot identification;
- manufacturing date; and
- use before or expiry date.

Feed ingredients consisting, containing or produced from GMOs should be labelled with reference to the genetic modification as a risk management measure.

#### 4.3 Traceability/Product Tracing and Record Keeping of Feed and Feed Ingredients

In order to facilitate product tracing of feed and feed ingredients, including additives, proper labeling and record keeping should be done at all stages of production and distribution. This should facilitate the prompt trace-back or trace-forward of materials and products if any actual or potential health risks are identified, and prompt and complete withdrawal or recall of products where necessary. Records should be maintained and readily available regarding the production, distribution and use of feed ingredients for as long as appropriate to enable trace-back should a safety problem emerge, and representative samples of feed and feed ingredients should be kept where applicable for a suitable period of time not less than six months.

Feed manufacturers should keep records containing full details of the supplier and date of receipt of feed ingredients, of the manufacturing process and the destination of all feed. These records could include:

- inventory records (including labels and invoices on received goods), actual formulae, mixing sheets, daily production logs, files of complaints, files on manufacturing errors and corrective actions taken, analytical results and investigations of out-of-tolerance sample results, records respecting the disposition of returned and recalled feeds and feed ingredients, records of

the disposition of flushed or recovered material, records of mixer validation and scale/metering device verification, etc.

#### 4.3.1 Special Conditions Applicable to Emergency Situations

Feed manufacturers should as soon as reasonable inform the competent authorities in the country in which they manufacture if they considered that a feed or feed ingredient does not satisfy the feed safety requirements established in this Code. The information should be as detailed as possible and should at least contain a description of the nature of the problem, a description of the feed or feed ingredients, the category of bird for which it is intended, the lot number identifier, the name of the manufacturer and the country of origin. The competent authorities and operators should immediately take effective measures to ensure that those feeds or feed ingredients do not pose any danger to consumers' health.

As soon as it becomes likely that a particular feed or feed ingredient is to be traded internationally and may pose a danger to consumers' health, the competent authorities of the exporting country should notify, at least, the competent authorities of the relevant importing countries. The notification should be as detailed as possible and should at least contain the particulars indicated in the previous paragraph.

#### 4.4 Inspection and Control Procedures

Feed and feed ingredients manufacturers and other relevant stakeholders in the industry should practice self-regulation/internal-controls to secure compliance with required standards for production, storage and transport. Risk-based official regulatory programs should be established to check that feed and feed ingredients are produced, distributed and used in such a way that poultry products for human consumption are both safe and suitable. Inspection and control procedures should be used to verify that feed and feed ingredients meet requirements in order to protect consumers against food-borne hazards. Inspection systems should be designed and operated on the basis of objective risk assessment appropriate to the circumstances. The risk assessment methodology employed should be consistent with internationally accepted approaches. Risk assessment should be based on current available scientific evidence.

Monitoring of feed and feed ingredients, whether by industry or official inspection bodies, should include inspection and sampling and analysis to detect unacceptable levels of undesirable substances.

#### 4.5 Health Hazards Associated with Animal Feed

All feed and feed ingredients should meet minimum safety standards. It is essential that levels of undesirable substances are sufficiently low in feed ingredients that their concentration in food for human consumption is consistently below the level of concern. Codex Maximum Residue Limits and Extraneous Substances Maximum Residue Levels set for feed should be applied. Maximum residue limits set for food, such as those established by the Codex Alimentarius Commission, may be useful in determining minimum safety standards for feed.

#### 4.5.1 Feed Additives and Veterinary Drugs Used in Medicated Feed

Feed additives and veterinary drugs used in medicated feed should be assessed for safety and used under stated conditions of use as pre-scribed by the competent authorities.

Veterinary drugs used in medicated feed should comply with the provisions of the Codex Recommended International Code of Practice for the Control of the Use of Veterinary Drugs.

Feed additives should be received, handled and stored to maintain their integrity and to minimize misuse or contamination. Feed containing them should be used in strict accordance with clearly defined instructions for use.

Antibiotics should not be used in feed for growth promoting purposes.

#### 4.5.2 Feed and Feed Ingredients

Feed and feed ingredients should only be produced, marketed, stored and used if they are safe and suitable, and, when used as intended, should not represent in any way an unacceptable risk to the health of consumer. In particular, feed and feed ingredients contaminated with unacceptable levels of undesirable substances should be clearly identified as unsuitable for animal feed and not be marketed or used.

Feed and feed ingredients should not be presented or marketed in a manner, which may confuse or mislead the user.

#### 4.5.3 Undesirable Substances

The presence in feed and feed ingredients of undesirable substances such as industrial and environmental contaminants, pesticides, radionuclides, persistent organic pollutants, pathogenic agents and toxins such as mycotoxins should be identified, controlled and minimized. Control measures applied to

reduce unacceptable levels of undesirable substances should be validated as to their attaining the desired impact on food safety.

The risks to the health of consumers, associated with the presence in the feed of each undesirable substance, should be assessed. This assessment should form the basis for the setting of maximum limits for feed and feed ingredients or the prohibition of certain materials from poultry feeding.

## 5. PRODUCTION, PROCESSING, STORAGE, TRANSPORT AND DISTRIBUTION OF FEED AND FEED INGREDIENTS

The production, processing, storage, transportation and distribution of safe and suitable feed and feed ingredients is the responsibility of all participants in the feed chain, including farmers, feed ingredient manufacturers, feed compounders, truckers, etc. Each participant in the feed chain is responsible for all activities, which are under their direct control including compliance with any applicable statutory requirements.

Feed and feed ingredients should not be produced, processed, stored, transported or distributed in facilities or using equipment where incompatible operations may affect their safety and lead to adverse effects on the health of consumers.

Where appropriate, operators should follow GMPs and, where applicable, HACCP principles to control hazards that may affect food safety. The aim is to ensure feed safety and in particular to prevent contamination of poultry feed and poultry food products as far as this is reasonably achievable, recognizing that total elimination of hazards is often not possible.

The effective implementation of GMPs and, where applicable, HACCP-based approaches should ensure, in particular, that the following areas are addressed.

### 5.1 Premises

Buildings and equipment used to process feed and ingredients should be constructed in a manner that permits ease of operation, maintenance and cleaning and minimizes feed contamination. Process flow within the manufacturing facility should also be designed to minimize feed contamination.

Water used in feed manufacture should meet hygienic standards and be of suitable quality for animals. Tanks, pipes and other equipment used to store and convey water should be of appropriate materials, which do not produce unsafe levels of contamination.

Sewage, waste and rain water should be disposed of in a manner which avoids contamination of equipment, feed and feed ingredients.

## 5.2 Receiving, Storage and Transportation

Chemical fertilizers, pesticides and other materials not intended for use in feed and feed ingredients should be stored separately from feed and feed ingredients to avoid the potential for manufacturing errors and contamination of feeds and feed ingredients.

Processed feed and feed ingredients should be stored separately from unprocessed feed ingredients and appropriate packaging materials should be used. Feed and feed ingredients should be received, stored and transported in such a way so as to minimize the potential for any cross-contamination to occur at a level likely to have a negative impact on food safety.

The presence of undesirable substances in feed and feed ingredients should be monitored and controlled.

Feed and feed ingredients should be delivered and used as soon as possible. All feed and feed ingredients should be stored and transported in a manner, which minimises deterioration and contamination and enables the correct feed to be sent to the right category of birds.

Care should be taken to minimize deterioration and spoilage at all stages of handling, storage and transport of feed and feed ingredients. Special precautions should be taken to limit fungal and bacterial growth in moist and semi-moist feeds. Condensation should be minimized in feed and feed ingredient manufacturing and processing facilities. Dry feed and feed ingredients should be kept dry in order to limit fungal and bacterial growth.

Waste feed and feed ingredients and other material containing unsafe levels of undesirable substances or any other hazards should not be used as feed, but should be disposed of in an appropriate manner including compliance with any applicable statutory requirements.

## 5.3 Personnel Training

All personnel involved in the manufacture, storage and handling of feed and feed ingredients should be adequately trained and aware of their roles and responsibilities in protecting food safety.

#### 5.4 Sanitation and Pest Control

Feed and feed ingredients, processing plants, storage facilities and their immediate surroundings should be kept clean and effective pest control programs should be implemented.

Containers and equipment used for manufacturing, processing, transport, storage, conveying, handling and weighing should be kept clean. Cleaning programs should be effective and minimize residues of detergents and disinfectants.

Machinery coming into contact with dry feed or feed ingredients should be dried following any wet cleaning process.

Special precautions should be taken when cleaning machinery used for moist and semi-moist feed and feed ingredients to avoid fungal and bacterial growth.

#### 5.5 Equipment Performance and Maintenance

All scales and metering devices used in the manufacture of feed and feed ingredients should be appropriate for the range of weights and volumes to be measured, and be tested regularly for accuracy.

All mixers used in the manufacturer of feed and feed ingredients should be appropriate for the range of weights or volumes being mixed and be capable of manufacturing suitable homogeneous mixtures and homogeneous dilutions, and be tested regularly to verify their performance.

All other equipment used in the manufacturer of feed and feed ingredients should be appropriate for the range of weights or volumes being processed, and be monitored regularly.

#### 5.6 Manufacturing Controls

Manufacturing procedures should be used to avoid cross-contamination (for example flushing, sequencing and physical clean-up) between batches of feed and feed ingredients containing restricted or otherwise potentially harmful materials (such as certain animal by-product meals, veterinary drugs). These procedures should also be used to minimize cross-contamination between medicated and non-medicated feed and other incompatible feeds. In cases where the food safety risk associated with cross-contamination is high and the use of proper flushing and cleaning methods is deemed insufficient,

consideration should be given to the use of completely separate production lines, transfer, storage and delivery equipment.

Pathogen control procedures, such as heat treatment or the addition of authorized chemicals, should be used where appropriate, and monitored at the applicable steps in the manufacturing process.

#### 5.7 Recalls

Records and other information should be maintained, as indicated at item 4.3, to include the identity and distribution path of feed and feed ingredients so that any feed or feed ingredient considered to pose a threat to consumers' health can be rapidly removed from the market and the birds exposed to the relevant feed can be identified.

### 6. ON-FARM PRODUCTION AND USE OF FEED AND FEED INGREDIENTS

This section provides guidance on the cultivation, manufacture, management and use of feed and feed ingredients on poultry farms.

This section should be used in conjunction with the applicable requirements of Sections 4 and 5.

To help ensure the safety of food used for human consumption, good agricultural practices should be applied during all stages of on-farm production of cereal grains used as feed or feed ingredients for food producing animals. Three types of contamination represent hazards at most stages of on-farm production of feed and feed ingredients, namely:

- Biological, such as bacteria, fungi and other microbial pathogens;
- Chemical, such as residues of medication, pesticides, fertilizer or other agricultural substances; and
- Physical, such as broken needles, machinery and other foreign material.

#### 6.1 Agricultural Production of Feed

Adherence to good agricultural practices is encouraged in the production of natural, improved and cultivated cereal grain crops used as feed ingredients for poultry animals. Following good agricultural practice standards will minimize the risk of biological, chemical and physical contaminants entering the food chain. Crops that produce bedding material or bedding materials such as

straw or wood shavings should also be managed in the same manner as animal feed ingredients. Good flock management practices, such as cleaning and sanitation of pens between batches of birds, should be used to reduce the risks of cross contamination.

#### 6.1.1 Site Selection

Land used for production of poultry feed and feed ingredients should not be located in close proximity to industrial operations where industrial pollutants from air, ground water or runoff from adjacent land would be expected to result in the production of foods of animal origin that may present a food safety risk. Contaminants present in runoff from adjacent land and irrigation water should be below levels that present a food safety risk.

#### 6.1.2 Fertilizers

Where manure fertilization of crops or pastures is practised, an appropriate handling and storage system should be in place and maintained to minimize environmental contamination, which could negatively impact on the safety of foods of animal origin.

Manure, compost and other plant nutrients should be properly used and applied to minimize biological, chemical and physical contamination of foods of animal origin, which could adversely affect food safety.

Chemical fertilizers should be handled, stored and applied in a manner such that they do not have a negative impact on the safety of foods of animal origin.

#### 6.1.3 Pesticides and Other Agricultural Chemicals

Pesticides and other agricultural chemicals should be obtained from safe sources. Where a regulatory system is in place, any chemical used shall comply with the requirements of that system.

Pesticides should be stored according to the manufacturer's instructions and used in accordance with Good Agricultural Practice in the use of pesticides (GAP). It is important that farmers carefully follow the manufacturer's instructions for use for all agricultural chemicals.

Pesticides and other agricultural chemicals should be disposed of responsibly in a manner that will not lead to contamination of any body of water, soil, feed or feed ingredients that may lead to the contamination of foods of animal origin which could adversely affect food safety.

## 6.2 Manufacturing of Feed On-Farm

### 6.2.1 Feed Ingredients

On-farm feed manufacturers should follow the applicable guidelines established in sub-section 4.1 of this code when sourcing feed ingredients off the farm.

Feed ingredients produced on the farm should meet the requirements established for feed ingredients sourced off the farm. For example, seed treated for planting should not be fed.

### 6.2.2 Mixing

On-farm feed manufacturers should follow the applicable guidelines established in Section 5. Particular attention should be given to item 5.6.

In particular, feed should be mixed in a manner that will minimize the potential for cross-contamination between feed or feed ingredients that may have an affect on the safety or withholding period for the feed or feed ingredients.

### 6.2.3 Monitoring Records

Appropriate records of feed manufacturing procedures followed by on-farm feed manufacturers should be maintained to assist in the investigations of possible feed-related contamination or disease events.

Records should be kept of incoming feed ingredients, date of receipt and batches of feed produced in addition to other applicable records set out in item 4.3.

## 6.3 Good Animal Feeding Practice

Good animal feeding practices include those practices, which help to ensure the proper use of feed and feed ingredients on-farm while minimizing biological, chemical and physical risks to consumers of foods of animal origin.

### 6.3.1 Water

Water for drinking should be of appropriate quality for the birds being fed.

### 6.3.2 Feeding

It is important that the correct feed is fed to the right category of bird and that directions for use are followed. Contamination should be minimized during feeding. Information should be available of what is fed to the birds and when, to ensure that food safety risks are managed.

Birds receiving medicated feed should be identified and managed appropriately until the correct withholding period (if any) has been reached and records of these procedures should be maintained. Procedures to ensure that medicated feed are transported to the correct location and are fed to animals that require the medication should be followed. Feed transport vehicles and feeding equipment used to deliver and distribute medicated feed should be cleaned after use, if a different medicated feed or non-medicated feed or feed ingredient is to be transported next.

### 6.4 Hygiene

The poultry production unit should be designed so that it can be adequately cleaned. The bird production unit and feeding equipment should be thoroughly cleaned regularly to prevent potential hazards to food safety. Chemicals used should be appropriate for cleaning and sanitizing feed manufacturing equipment and should be used according to instructions. These products should be properly labeled and stored away from feed manufacturing, feed storage and feeding areas.

A pest control system should be put in place to control the access of pests to the bird production unit to minimize potential hazards to food safety from feed.

## 7. METHODS OF SAMPLING AND ANALYSIS

### 7.1 Sampling

Sampling protocols set out in ISO or Codex Alimentarius Standards should be followed.

### 7.2 Analysis

Laboratory methods developed and validated using scientifically recognized principles and procedures should be used. When selecting methods, consideration should also be given to practicability, with preference given to those methods, which are reliable and applicable for routine use. Laboratories conducting routine analyses of feed and feed ingredients should ensure their

analytical competency with each method used and maintain appropriate documentation.