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SPECIFICATION FOR
COMPOUND POULTRY FEEDS
(SECOND REVISION)

SRI LANKA STANDARDS INSTITUTION

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SLS 244 : 1999

Gr. 11

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SRI LANKA

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

SPECIFICATION FOR COMPOUND POULTRY FEEDS (SECOND REVISION)

FOREWORD

This Sri Lanka Standard was approved by the Sectoral Committee on Agriculture and Food products and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 1999-06-17.

This specification was first published in 1973 and revised in 1988. In this second revision new product names of feeds for poultry and basic and additional nutritional requirements had been considered. Types of feeds for turkeys and ducks although not manufactured presently, are given as a guideline to any interested party.

The requirements have been revised. Where appropriate, these requirements have been based on the nutrient requirements of poultry and include safety margins. The nutritional requirements have been categorized as basic nutritional and compositional requirements, and additional nutritional requirements. Compound poultry feeds shall be tested to determine whether they conform to basic nutritional and compositional requirements prescribed in this standard. Tests for additional nutritional requirements shall be carried out only if requested by the purchaser or any interested party.

This specification is subject to the provisions of the Animal Feed Act No. 15 of 1986 and regulations framed thereunder.

Guidelines for the determination of a compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in appendix **A.**

All standard values given in this specification are in SI units.

For the purpose of deciding whether a particular requirement of this specification is complied with, the final value, observed or calculated, expressing the result of a test or an analysis, shall be rounded off in accordance with **CS 102**. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this specification, the assistance obtained from the Department of Animal Production and Health and the Veterinary Research Institute of Sri Lanka is gratefully acknowledged.

1. SCOPE

This specification prescribes the requirements and methods of test for poultry feeds.

2. REFERENCES

CS 102 Presentation of numerical values.
CS 124 Test sieves.
SLS 428 Random sampling methods.
SLS 626 Methods of test for animal feeds.

3. DEFINITIONS

For the purpose of this specification, the following definitions shall apply :

3.1 compound poultry feeds : Compound feeds in mash, crumb or pellet form intended as complete diets for various physiological classes of domestic fowl (*Gallus domesticus*), turkey (*Meleagris gallopavo*) and duck (*Anas platyrhynchos*).

3.2 chickens : Domestic fowls kept for egg or meat production; they include laying hens, breeding chickens, replacement chickens and broiler chickens.

3.2.1 *laying hens* : Females kept primarily for table egg production; they are light or semiheavy, according to body weight.

3.2.2 *breeding chickens* : Males and females kept primarily for hatching egg production; they are light, semiheavy or heavy according to body weight.

3.2.3 *replacement chickens* : Females reared to replace laying hens or males and females reared to replace breeding chickens.

3.2.4 *broiler chickens* : Fast -growing males and females reared exclusively for meat production.

3.3 turkeys : Turkeys kept for meat production; they include table turkeys, replacement turkeys and breeding turkeys.

3.3.1 *table turkeys* : Fast-growing males and females reared exclusively for meat production.

3.3.2 *replacement turkeys* : Male and female turkeys reared to replace breeding turkeys.

3.3.3 *breeding turkeys* : Male and female turkeys kept primarily for the production of hatching turkey eggs.

3.4 ducks : Ducks kept for meat production; they include table ducks, replacement ducks and breeding ducks.

3.4.1 *table ducks* : Fast-growing male and female ducks reared exclusively for meat production.

3.4.2 *replacement ducks* : Male and female ducks reared to replace breeding ducks.

3.4.3 *breeding ducks* : Male and female ducks kept primarily for the production of hatching duck eggs.

4. TYPES

Poultry feeds shall be of the following types in terms of species:

4.1 Feeds for chickens

These include feeds for broiler chickens, replacement chickens, laying hens and breeding chickens.

4.2 Feeds for turkeys

These include feeds for table turkeys, replacement turkeys and breeding turkeys.

4.3 Feeds for ducks

These include feeds for table ducks, replacement ducks and breeding ducks; feeds designed exclusively for laying ducks may not be required since feeds for laying hens are also suitable for laying ducks.

5. PRODUCT NAMES

The poultry feeds shall be assigned the following product names :

5.1 Product names of feeds for chicken

The products covered under this category assume a two or three-stage rearing programme for replacement chickens and a single diet during the laying period and a two or three stage rearing programme for broiler chickens.

5.1.1 *Chick starter feed*

For liberal feeding of replacement chickens from hatching to 6 to 8 weeks of age.

5.1.2 *Chick grower or chick developer and grower feed*

For liberal or controlled feeding of replacement layer chickens from about 6 to 8 weeks to 18 to 20 weeks of age.

5.1.3 *Layer feed*

For liberal or controlled feeding of laying hens during the laying period starting from 18 to 20 weeks of age.

5.1.4 *Chick breeder feed*

For controlled feeding of broiler breeders and hen breeders during the breeding period.

5.1.5 *Broiler starter or broiler booster and starter feed*

For liberal feeding of broiler chickens from hatching to 3 to 4 weeks of age.

5.1.6 *Broiler finisher feed*

For liberal feeding of broiler chickens from about 3 to 4 weeks to 5 to 7 weeks of age.

5.2 Product names of feeds for turkeys

The products covered under this category assume a three-stage rearing programme for table turkeys and a four-stage one for replacement turkeys. The exact duration of each stage shall depend on whether the turkeys are of small or large type.

5.2.1 *Turkey starter feed*

For liberal feeding of starting table turkeys and starting replacement turkeys from hatching to 6 weeks of age.

5.2.2 *Turkey grower feed*

For liberal feeding of growing table turkeys and growing replacement turkeys from about 6 to 12 weeks of age.

5.2.3 *Turkey finisher feed*

For liberal feeding of finishing table turkeys from 12 weeks of age to point of slaughter and for controlled feeding of growing replacement turkeys from 12 to 16 weeks of age.

5.2.4 *Turkey pre-breeder feed*

For controlled feeding of replacement turkeys from 16 weeks of age to 4 weeks before breeding commences.

5.2.5 *Turkey breeder feed*

For controlled feeding of breeding turkeys starting from 4 weeks before breeding commences.

5.3 Product names of feeds for ducks

The products covered under this category assume a two-stage rearing programme for table ducks and a three-stage one for replacement ducks.

5.3.1 *Duck starter feed*

For liberal feeding of starting table ducks and starting replacement ducks from hatching to 4 weeks of age.

5.3.2 *Duck grower-finisher feed*

For liberal feeding of growing-finishing table ducks from 4 weeks of age to point of slaughter and for controlled feeding of growing replacement ducks from 4 to 8 weeks of age.

5.3.3 *Duck pre-breeder feed*

For controlled feeding of replacement ducks from 8 to 20 weeks of age.

5.3.4 *Duck breeder feed*

For controlled feeding of breeding ducks

6. REQUIREMENTS

6.1 Basic nutritional and compositional requirements

The feeds for chickens, parent birds, turkeys and ducks shall conform to the basic requirements given in Tables **1 A, 1 B, 2** and **3** respectively.

TABLE 1 A - Basic requirements for feeds for chickens

Sl. No. (1)	Characteristic (2)	Product name					Method of test reference to (8)
		Chick starter (3)	Chick grower (4)	Layer (5)	Broiler starter (6)	Broiler finisher (7)	
i)	Moisture, percent by mass, max.	12.0	12.0	12.0	12.0	12.0	5 of SLS 626 : 1983
ii)	Metabolizable energy, kcal/kg, min.	2750	2700	2700	2800	2900	Appendix B
iii)	Crude protein, per cent by mass, min.	18.5	15.5	16.0	21.0	19.0	6 of SLS 626 : 1983
iv)	Crude fat, per cent by mass	3.0 to 6.0	3.0 to 7.0	3.0 to 10.0	3.0 to 10.0	3.0 to 10.0	7 of SLS 626 : 1983
v)	Crude fibre, per cent by mass, max.	6.0	7.0	7.0	6.0	6.0	8 of SLS 626 : 1983
vi)	Calcium, per cent by mass	1.0 to 1.2	0.9 to 1.2	3.5 to 4.5	1.0 to 1.2	0.8 to 1.2	11 of SLS 626 : 1983
vii)	Phosphorus, inorganic, per cent by mass, min.	0.45	0.40	0.40	0.45	0.40	12 of SLS 626 : 1983
viii)	Acid-insoluble ash, per cent by mass, max.	3.5	4.0	4.0	3.0	3.0	10 of SLS 626 : 1983

TABLE 1 B - Basic requirements for feeds for parent birds (breeder stocks)

Sl. No.	Characteristic	Product name						Method of test Ref. to
		Layer starter	Layer grower	Layer breeder	Broiler starter	Broiler grower	Broiler breeder	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	Moisture, per cent by mass, max.	12.0	12.0	12.0	12.0	12.0	12.0	5 of SLS 626 : 1983
ii)	Metabolizable energy, kcal/kg, min.	2850	2750	2750	2800	2700	2700	Appendix B
iii)	Crude protein, per cent by mass, min.	19.0	16.0	17.0	18.0	16.0	17.0	6 of SLS 626 : 1983
iv)	Crude fat, per cent by mass	3.0 to 6.0	3.0 to 7.0	3.0 to 6.0	3.0 to 6.0	3.0 to 7.0	3.0 to 7.0	7 of SLS 626 : 1983
v)	Crude fibre, per cent by mass, max.	5.0	6.0	6.0	5.0	6.0	6.0	8 of SLS 626 : 1983
vi)	Calcium, per cent by mass	1.0 to 1.2	0.9 to 1.2	3.5 to 4.5	1.0 to 1.2	0.9 to 1.2	3.5 to 4.5	11 of SLS 626 : 1983
vii)	Phosphorus, inorganic, per cent by mass, min.	0.45	0.40	0.40	0.45	0.45	0.45	12 of SLS 626 : 1983
viii)	Acid-insoluble ash, per cent by mass, max.	3.5	4.0	4.0	3.5	4.0	4.0	10 of SLS 626 : 1983

TABLE 2 - Basic requirements for feeds for turkeys

Sl. No (1)	Characteristic (2)	Product name					Method of test Ref. to (8)
		Turkey starter (3)	Turkey grower (4)	Turkey finisher (5)	Turkey pre breeder (6)	Turkey breeder (7)	
i)	Moisture, per cent by mass max.	12.0	12.0	12.0	12.0	12.0	5 of SLS 626 : 1983
ii)	Metabolizable energy kcal/kg, min.	2750	2700	2700	2550	2650	Appendix B
iii)	Crude protein, per cent by mass, min.	28.0	24.0	18.0	14.0	16.0	6 of SLS 626 : 1983
iv)	Crude fat, per cent by mass	3.0 to 6.0	3.0 to 6.0	3.0 to 6.0	3.0 to 6.0	3.0 to 6.0	7 of SLS 626 : 1983
v)	Crude fibre, per cent by mass, max.	5.0	6.0	6.5	7.0	6.5	8 of SLS 626 : 1983
vi)	Calcium, per cent by mass	1.0 to 1.2	0.8 to 1.2	0.8 to 1.2	0.8 to 1.2	2.0 to 2.5	11 of SLS 626 : 1983
vii)	Phosphorus, inorganic, per cent by mass, min.	0.5	0.45	0.40	0.35	0.40	12 of SLS 626 : 1983
viii)	Acid-insoluble ash, per cent by mass, max.	3.0	3.0	3.0	3.5	3.5	10 of SLS 626 : 1983

NOTE :

The values for characteristics ii) to viii) are expressed on the assumption that the product contains 10 per cent moisture. Therefore calculated values shall be corrected to a 10 per cent moisture content.

TABLE 3 - Basic requirements for feeds for ducks

Sl. No.	Characteristic	Product name				Method of test Ref. to
		Duck starter	Duck grower-finisher	Duck pre-breeder	Duck breeder	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Moisture, per cent by mass, max.	12.0	12.0	12.0	12.0	5 of SLS 626 : 1983
ii)	Metabolizable energy, kcal/kg, min.	2700	2700	2550	2600	Appendix B
iii)	Crude protein, per cent by mass, min.	19.0	17.0	14.0	16.0	6 of SLS 626 : 1983
iv)	Crude fat, per cent by mass	3.0 to 6.0	3.0 to 6.0	3.0 to 6.0	3.0 to 6.0	7 of SLS 626 : 1983
v)	Crude fibre, per cent by mass, max.	6.0	6.5	7.0	7.0	8 of SLS 626 : 1983
vi)	Calcium, per cent by mass	1.0 to 1.2	0.8 to 1.2	0.8 to 1.2	2.8 to 3.5	11 of SLS 626 : 1983
vii)	Phosphorus, inorganic, per cent by mass, min.	0.40	0.35	0.30	0.40	12 of SLS 626 : 1983
viii)	Acid-insoluble ash, per cent by mass, max.	3.0	3.0	3.5	3.5	10 of SLS 626 : 1983

NOTE :

The values for characteristics ii) to viii) are expressed on the assumption that the product contains 10 per cent moisture. Therefore calculated values shall be corrected to a 10 per cent moisture content.

6.2 Additional nutritional requirements

The feeds for chickens, turkeys and ducks shall conform to the additional requirements specified in **6.2.1** and **6.2.2.**

NOTE

Products need not be tested in all cases for these requirements when ascertaining its conformity to this specification. Tests for additional nutritional requirements should be carried out only if requested by the interested party.

6.2.1 *Amino-acid, linoleic-acid and sodium levels*

The feeds for chickens, parent birds, turkeys and ducks shall conform to the lysine, methionine, methionine and cystine, linoleic acid and sodium levels given in Tables 4C , 4D, 5 and 6 respectively.

TABLE 4C - Additional requirements for feeds for chickens

Sl. No.	Characteristic (Total level)	Product name				
		Chick starter	Chick grower	Layer	Broiler starter	Broiler finisher
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Lysine, per cent by mass	0.95-1.05	0.65-0.80	0.70-0.78	1.10-1.15	0.95-1.00
ii)	Methionine, per cent by mass	0.37-0.38	0.29-0.34	0.34-0.35	0.45-0.50	0.40-0.43
iii)	Methionine and cystine, per cent by mass	0.65-0.67	0.52-0.58	0.60-0.62	0.82-0.85	0.70-0.75
iv)	Sodium, per cent by mass	0.15-0.25	0.12-0.25	0.12-0.25	0.15-0.25	0.12-0.25
v)	Linoleic acid, per cent by mass	1.20-1.40	0.80-1.00	1.20-1.50	0.80-1.50	0.50-1.50

NOTE

All values are expressed on the assumption tha the product contains 10 per cent moisture.

TABLE 4D - Additional requirements for feeds for parent birds

Sl. No.	Characteristic (Total level)	Product name					
		Layer starter	Layer grower	Layer breeder	Broiler starter	Broiler grower	Broiler breeder
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Lysine, per cent by mass	0.95-1.00	0.70-0.75	0.71-0.84	0.90-0.95	0.72-0.75	0.75-0.80
ii)	Methionine, per cent by mass	0.40-0.42	0.34-0.36	0.36-0.40	0.40-0.45	0.35-0.40	0.36-0.40
iii)	Methionine and cystine, per cent by mass	0.70-0.72	0.59-0.62	0.63-0.70	0.70-0.75	0.58-0.60	0.60-0.65
iv)	Sodium, per cent by mass	0.12-0.25	0.12-0.25	0.12-0.25	0.12-0.25	0.12-0.25	0.12-0.25
v)	Linoleic acid, per cent by mass	1.20-1.25	0.80-1.00	1.30-1.40	1.30-1.35	1.00-1.35	1.30-1.35

NOTE :

All values are expressed on the assumption that the product contains 10 per cent moisture.

TABLE 5 - Additional requirements for feeds for turkeys

Sl. No.	Characteristic (Total level)	Product name				
		Turkey starter	Turkey grower	Turkey finisher	Turkey prebreeder	Turkey breeder
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Lysine, per cent by mass	1.70-1.75	1.30-1.40	0.80-1.00	0.60-0.65	0.75-0.80
ii)	Methionine, per cent by mass	0.55-0.60	0.45-0.50	0.35-0.40	0.25-0.30	0.35-0.38
iii)	Methionine and cystine, per cent by mass	1.05-1.10	0.80-0.90	0.55-0.60	0.40-0.45	0.55-0.60
iv)	Sodium, per cent by mass	0.15-0.25	0.12-0.25	0.12-0.25	0.12-0.25	0.12-0.25
v)	Linoleic acid, per cent by mass, min.	1.0	0.8	0.6	0.6	1.0

NOTE:

All values are expressed on the assumption that the product contains 10 per cent moisture.

TABLE 6 - Additional requirements for feeds for ducks

Sl. No.	Characteristic (Total level)	Product name			
		Duck starter	Duck grower-finisher	Duck prebreeder	Duck breeder
(1)	(2)	(3)	(4)	(5)	(6)
i)	Lysine, per cent by mass	1.00-1.05	0.80-0.90	0.60-0.75	0.70-0.80
ii)	Methionine, per cent by mass	0.45-0.50	0.40-0.45	0.30-0.32	0.35-0.40
iii)	Methionine and cystine, per cent by mass	0.75-0.80	0.65-0.70	0.45-0.50	0.60-0.65
iv)	Sodium, per cent by mass	0.12-0.25	0.12-0.25	0.12-0.25	0.12-0.25
v)	Linoleic acid, per cent by mass, min	0.8	0.8	0.8	0.8

NOTE

All values are expressed on the assumption that the product contains 10 per cent moisture.

6.2.2 *Supplementary levels of vitamins and trace-elements*

The feeds for chicken and ducks shall conform to the supplementary levels of vitamins and trace-elements given in Table 7. The feeds for turkeys shall conform to the supplementary levels of vitamins and trace-elements given in Table 8.

TABLE 7 - Supplementary levels of vitamins and trace-elements for chickens and ducks (per kilogramme of feed)

Sl. No.	Characteristic (Supplementation level)	Product name					
		Chick starter and Duck starter	Chick grower, Duck grower finisher and Duck prebreeder	Layer	Broiler and Layer parent stocks	Broiler starter	Broiler finisher
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Vitamin A, IU	10 000 - 12000	7500 - 10000	8000 - 15000	12000 - 16000	12000 - 15000	8000 - 12000
ii)	Vitamin D_3, IU	2 000 - 3000	1500 - 3000	2000 - 3000	2000 - 3000	2000 - 3000	1600 - 2000
ii)	Vitamin E, IU	10 - 20	10 - 20	10 - 20	15 - 30	15 - 30	10 - 30
iv)	Vitamin K_3 , mg	1.5 - 3.0	1.0 - 3.0	0.5 - 3.0	2.0 - 3.0	2.0 - 3.0	1.0 - 3.0
v)	Thiamine, mg	1 - 2	1 - 2	1 - 2	2 - 3	1 - 2	1 - 2
vi)	Riboflavin, mg	4 - 5	4 - 5	4 - 5	6 - 8	5 - 8	4 - 5
vii)	Nicotinic acid, mg	20 - 30	15 - 30	10 - 30	25 - 40	25 - 40	20 - 30
viii)	Pyridoxine , mg	0.5 - 3.0	0.5 - 3.0	1 - 4	1 - 4	1 - 3	0.5 - 3.0
ix)	Pantothenic acid, mg	8 - 10	5 - 10	5 - 10	10 - 20	10 - 15	8 - 10
x)	Biotin, µg	50 - 200	0 - 50	5 - 10	100 - 200	50 - 75	0 - 50
xi)	Folic acid, mg	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	1.0 - 3.0	1.0 - 1.5	0.5 - 1.0
xii)	Choline chloride , mg	100 - 250	100 - 200	100 - 250	200 - 500	450 - 600	200 - 500
xiii)	Vitamin B_{12} , µg	10 - 15	5 - 10	5 - 10	10 - 20	10 - 20	10 - 15
xiv)	Manganese , mg	55 - 100	45 - 100	60 - 100	60 - 100	60 - 100	55 - 100
xv)	Zinc , mg	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60	50 - 60
xvi)	Iron, mg	20 - 25	20 - 25	20 - 25	20 - 25	25 - 30	25 - 30
xvii)	Copper , mg	5 - 10	5 - 8	5 - 10	5 - 10	5 - 8	5 - 8
xviii)	Cobalt , mg	0.1 - 0.4	0.1 - 0.4	0.1 - 0.4	0.1 - 0.5	0.1 - 0.4	0.1 - 0.4
xix)	Iodine , mg	0.5 - 1.0	0.5 - 1.0	0.5 - 1.0	0.5 - 2.0	0.5 - 1.0	0.5 - 1.0
xx)	Selenium, mg	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2	0.1 - 0.2

NOTE All values are expressed on the assumption that the product contains 10 per cent moisuture

TABLE 8 - Supplementary levels of vitamins and trace-elements for turkeys (per kilogramme of feed)

Sl. No. (1)	Characteristic (Supplementation level) (2)	Product name				
		Turkey starter (3)	Turkey grower (4)	Turkey grower-finisher (5)	Turkey pre-breeder (6)	Turkey breeder (7)
i)	Vitamin A, IU	12 000	10 000	10 000	10 000	12 000
ii)	Vitamin D_3 , IU	2 400	2 000	2 000	2 000	2 400
iii)	Vitamin E, IU	15	10	10	10	15
iv)	Vitamin K_3 , mg	3	2	2	2	2
v)	Thiamine, mg	2	1	1	1	2
vi)	Riboflavin. mg	8	5	5	5	8
vii)	Nicotinic acid, mg	50	25	25	25	50
viii)	Pyridoxine, mg	2	2	2	2	2
ix)	Pantothenic acid, mg	15	10	10	10	15
x)	Biotin, µg	200	50	50	50	150
xi)	Folic acid, mg	1.5	1	1	1	1.5
xii)	Choline chloride , mg	450	200	200	200	200
xiii)	Vitamin B_{12} , µg	12	10	10	10	12
xiv)	Manganese, mg	80	80	80	80	80
xv)	Zinc, mg	50	50	50	50	50
xvi)	Iron. mg	25	25	25	25	25
xvii)	Copper , mg	5	5	5	5	5
xviii)	Cobalt, mg	0.5	0.5	0.5	0.5	0.5
xix)	Iodine, mg	0.5	0.5	0.5	0.5	0.5
xx)	Selenium, mg	0.1	0.1	0.1	0.1	0.1

NOTE

All values are expressed on the assumption that the product contains 10 per cent moisture.

6.3 Particle size

6.3.1 *Mash form*

The particle size of any poultry feed in mash form shall be such that not less than 55 per cent by mass of the material passes through a 710 µm sieve and not less than 75 per cent by mass of the material is retained on a 212 µm sieve when tested in accordance with Clause 4 of **SLS 626 : 1983.** The sieves used shall conform to **CS 124.**

6.3.2 *Pellet form*

The particle size of chick starter and broiler starter feeds shall be not more than 3 mm and of other feeds for chickens it shall be not more than 4 mm. The particle size of turkey starter feed shall be not more than 3 mm and of other feeds for turkeys it shall be not more than 5 mm. The particle size of feeds for ducks shall be same as that of feeds for turkeys.

6.3.3 *Crumble form*

The particle size of any poultry feed in crumble form shall be not more than 4 mm.

6.4 Rancidity

Poultry feeds shall be free from rancid odour.

6.5 Mouldiness

Poultry feeds shall be free from mouldiness.

6.6 Adulteration

Poultry feeds shall be free from adulteration.

6.7 Anticoccidial agent

Poultry feeds shall contain recommended anticoccidial agent as specified in the First Scheme, Table XIII of the Animal Feed Act No. 15 of 1986.

6.8 Additives and other substances

This Clause will be covered by regulations made under section 31 of the Animal Feed Act No. 15 of 1986.

7. PACKAGING AND MARKING

7.1 Packaging

The product shall be packed in clean and sound paper bags of at least three plies or any other suitable container/material. The mouth of each bag or container should be properly sealed.

7.2 Marking

7.2.1 The packages shall be legibly and indelibly marked or a label shall be affixed with the following information :

a) Product name of poultry feed (See 5);
b) Trade name;
c) Name and address of the manufacturer;
d) Date of packaging;
e) Batch or code number;
f) Net mass, in kg;
g) Analytical values of
   (i) Metabolizable energy, kcal/kg,
   (ii) Crude protein, per cent by mass,
   (iii)Crude fat, per cent by mass,
   (iv) Crude fibre, per cent by mass,
   (v) Calcium, per cent by mass, and
   (vi) Inorganic phosphorus, per cent by mass;
h) Logo for approved animal feeds and licence number;
j) Expiry date; and
k) Any other marking prescribed by the regulations under the Animal Feed Act No. 15 of 1986.

8. SAMPLING

The sampling shall be carried out as prescribed in Appendix A.

9. METHOD OF TEST

9.1 Basic nutritional and compositional requirements

Tests shall be carried out as prescribed in Column 8, Column 9, Column 8 and Column 7 of Tables 1A, 1B, 2 and 3 respectively.

9.2 Particle size

The test shall be carried out as prescribed in Clause 4 of **SLS 626 : 1983.**

10. CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied :

10.1 Each package inspected as in **A.3.1** satisfies the relevant requirements.

10.2 Each package inspected as in **A.3.2** satisfies the relevant requirements.

10.3 The composite sample tested as in **A.3.3** satisfies the relevant requirements.

APPENDIX A
SAMPLING OF POULTRY FEED

A.1LOT

In any consignment, all the packages of the same size and containing poultry feeds of the same type and belonging to one batch of manufacture or supply shall constitute a lot.

A.2SCALE OF SAMPLING

A.2.1 Samples shall be tested from each lot for ascertaining its conformity to the requirements of this specification.

A.2.2 The number of packages to be selected from a lot shall be in accordance with Table **9.**

TABLE 9 - Scale of sampling

Number of packages in the lot (1)	Number of packages to be selected (2)
Up to 50	3
51 to 100	4
101 to 250	5
251 to 500	7
501 to 1 000	10
1 001 and above	15

A.2.3 The packages shall be selected at random. In order to ensure randomness of selection tables of random numbers as given in **SLS 428** shall be used.

A.3 NUMBER OF TESTS

A.3.1 Each package selected as in **A.2.2** shall be inspected for packaging and marking requirements.

A.3.2 Each package selected as in **A.2.2** shall be examined for the requirements given in **6.4, 6.5** and **6.6.**

A.3.3 A sufficient quantity of material shall be taken from each package selected as in **A.2.2** and the material thus obtained shall be mixed to form a composite sample. This composite sample shall be tested for basic requirements given in **6.1.**

NOTE

Tests for additional nutritional requirements should be carried out only if specifically requested.

APPENDIX B
DETERMINATION OF METABOLIZABLE ENERGY

B.1 PRINCIPLE

The metabolizable energy (ME) content of a compound poultry feed is estimated from the amounts of crude protein, crude fat, starch and sugar contained in that feed.

B.2 DETERMINATION OF CRUDE PROTEIN

Crude protein of the feed sample shall be carried out as prescribed in accordance with Clause 6 of **SLS 626 : 1983.**

B.3 DETERMINATION OF CRUDE FAT

Crude fat of the feed sample shall be carried out as prescribed in accordance with Clause 7 of **SLS 626 : 1983**.

B.4 DETERMINATION OF SUGAR AND STARCH

B.4.1 *Principle*

Sugars are separated from the test sample by alcohol extraction, the residual starch is brought into solution with perchloric acid. When heated in strong acid, sugars react with the anthrone reagent to form coloured furfural derivatives measured by absorbance at 620 nm after 20 min. to 30 min.

B.4.2 *Apparatus*

B.4.2.1 *Spectrophotometer* suitable for measurements at a wave length of 620 nm.

B.4.3 *Reagents*

B.4.3.1 *Anthrone reagent*

Dissolve 1 g of anthrone in 1 litre of sulfuric acid solution containing 760 ml of concentrated sulfuric acid that has been left to cool to room temperature.

B.4.3.2 *Standard glucose solution*

Dilute a stock standard solution of glucose to obtain a glucose solution containing 100 µg/ml.

B.4.4 *Procedure*

B.4.4.1 *Preparation of sample solutions*

B.4.4.1 a) Extraction of sugars from test material

Weigh about 0.2 g of finely ground material into a centrifuge tube, add two drops of 80 per cent alcohol to aid mixing, and then 5 ml of water and stir thoroughly. Add 25 ml of hot 80 per cent alcohol and stir thoroughly, set aside for 5 minutes and centrifuge for 5 minutes. Decant the alcoholic solution and repeat the alcohol extraction procedure by adding 30 ml of hot 80 per cent alcohol to the residue (see Note). Combine the two alcohol extracts. Alcohol interferes with colour development in the anthrone-sugar reaction and is removed from the combined extracts by evaporation under reduced pressure at 40 °C. Dilute the remaining cloudy aqueous fraction with water to a final concentration of sugars equivalent to about 100 µg of glucose/ml. The aqueous solution of sugars is then ready for analysis with anthrone reagent.

NOTE

Reserve the centrifuge tube and its contents for the extraction of starch (see B.4.4.1.b).

B.4.4.1.b) Extraction of starch from test materials

The extraction of starch is carried out at room temperature. Add 5 ml of water to the centrifuge tube containing the residue reserved from the extraction of sugars [See B.4.4.1.a] and while stirring, add 6.5 ml of 52 per cent perchloric acid (prepared by adding 270 ml of 72 per cent perchloric acid to 100 ml of water). Stir continuously for 5 minutes with a glass rod and then occasionally for the next 15 minutes. Add 20 ml of water and centrifuge. Pour the supernatent liquid into a 100 ml volumetric flask. Add 5 ml of water to the residue and repeat the extraction with perchloric acid, stirring occasionally for the next 30 minutes. Wash the contents of the tube into the flask containing the first extract. Dilute the combined extracts to 100 ml with water and filter, discarding the first 5 ml of the filtrate. Dilute in aliquot portion to give a final concentration equivalent to about 100 µg glucose/ml which is then ready for analysis with the anthrone reagent.

B.4.4.2 *Determination*

Prepare the following solutions in boiling tubes :

a) blank containing 2 ml of water in duplicate;

b) test extract containing 1 ml of diluted extract and 1 ml of water in triplicate; and

c) test extract and glucose standard containing 1 ml of diluted extract and 1 ml (100 µg) of glucose standard in triplicate.

Add 10 ml of anthrone reagent (B.4.3.1) to all the test tubes and mix the contents thoroughly. Heat the tubes (closed with rubber stoppers containing a piece of capillary glass tubing) on a boiling water bath for 12 minutes and cool to room temperature. Measure the intensity of colour developed at 620 nm using spectrophotometer.

B 4.5 *Calculation*

Take the average of the two sets of triplicate readings and calculate the equivalent quantity of glucose in the test extract by comparison with the increased absorption due to 100 µg of glucose. For both extracts use this value and a dilution factor (and the conversion factor 0.9 for the starch extract only since 0.9 g starch yield approximately 1.0 g glucose on hydrolysis) to calculate the percentage of sugar and starch respectively in the original material.

B.5 CALCULATION OF METABOLIZABLE ENERGY

Calculate the metabolizable energy of the feed using the following formula :

Metabolizable energy (kcal/kg) = 53 + 38 (% crude protein + 2.25 x % crude fat + 1.1 x % starch + % sugar)

NOTE

This test method is based on the following publications :

a) Carpenter K.J. and Clegg K.M.
The metabolozable energy of poultry feeding stuffs in relation to their chemical composition.

J.Sc. Food and Agri., 7 1956, page 45 - 51.

b) Clegg K.M.
The application of the Anthrone reagent to the estimation of starch in cereals.
J.Sc. Food and Agri., 7 1956, page 40 - 44.

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