भारतीय मानक **IS 7472 : 2024**

Indian Standard

सुअर के लिए आहार — विशिष्टि

(दूसरा पुनरीक्षण)

Pig Feeds — Specification

(Second Revision)

ICS 65.120

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

October 2024 **Price Group 7**

Animal Feeds and Nutrition Sectional Committee, FAD 05

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Animal Feeds and Nutrition Sectional Committee had been approved by the Food and Agriculture Division Council.

Piggery development is making a rapid progress within the country. A large number of farms have been established where pig rearing and breeding has been undertaken on scientific lines. It is important that for the production of good quality pork at minimum cost, the pigs are properly fed so as to meet their nutritional requirements. To keep pace with the piggery development, the manufacture of compound pig feeds and their marketing has also commenced in the country. Therefore, with a view to enable the manufacturers to prepare pig feeds of known quality, this standard has been prepared.

This standard was first published in 1974 and revised in 1986. In the first revision, the requirement for moisture content was modified and the test methods for various requirements were aligned with IS 7874 (Part 1).

In this revision, the standard has been updated considering latest technological developments and manufacturing practices. Following major changes have been done:

a) Requirements for total protein and total fibre has been updated;

b) Requirement for aflatoxin B_1 has been introduced in the standard;

c) Methods of tests prescribed for determination of various requirements have been updated; and

d) List of ingredients for pig feed has been updated based on the latest technological developments and current manufacturing practices.

The composition of the Committee responsible for the formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PIG FEEDS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements, and methods of sampling and test for pig feeds.

2 REFERENCES

The standards listed in Annex A contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

3 TYPES

Pig feeds shall be of the following three types:

a) Pig starter/creep feed — A ration to be fed up to 2 months of age when the litter is with sow;

b) Pig growth meal — A ration to be fed from 2 months to 5 months of age; and

c) Pig finishing/breeding meal — A ration to be fed after 5 months of age or body weight over 35 kg.

4 REQUIREMENTS

4.1 General

Pig feeds shall be in the form of pellets, cubes, crumbs or meal. The feeds shall be free from rancidity, musty odour, harmful constituents, such as dust, metallic pieces or any other hazardous objects such as plastic, rubber, glass, etc. It shall be free from adulterants, insect infestation and visible fungus growth.

4.2 Ingredients

The ingredients given in Annex B shall only be used for manufacturing pig feeds. Urea and other non-nitrogenous substances, except amino-acids, shall not be added to the product.

No antibiotics shall be incorporated in pig feed for growth promotion. To counter the non-usage of antibiotics as feed supplements, the use of probiotics, prebiotics, postbiotics, and plant-based preparations is encouraged, along with proper biosecurity measures.

4.3 The material shall also conform to the requirements prescribed in Table 1.

4.4 The minerals listed in Table 2 either from the natural sources or from any added sources shall be declared by the manufacturer after periodic testing, in proportions indicated against each.

4.5 Pig feeds shall contain the vitamins in quantity not less than the value shown against each as per Table 3 and shall be declared by the manufacturer.

5 PACKING AND MARKING

5.1 Packing

Pig feeds shall be packed in dry, clean and sound plain or polyethylene lined jute or laminated paper bags or HDPE bags. The mouth of each bag shall be either machine-stitched or rolled over and hand-stitched.

5.2 Marking

5.2.1 Each bag shall be indelibly and legibly marked to give the following information:

a) Name and type of the material;

b) Name and address of the manufacturer;

c) Quantity of antibiotics or other additives, if added (*see* **4.2**);

d) Net mass in kg;

e) Batch or code number;

f) Declaration (*see* Table 2 and **4.2** and **4.5**);

g) Best before date in month and year format;

h) Quantity of vitamins added (*see* **4.5**); and

j) Any other requirements as specified under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011

5.2.2 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material for ascertaining conformity to this standard shall be determined according to the method prescribed in Annex D of IS 2052.

7 TESTS

7.1 Tests shall be carried out as prescribed in co1 (6) of Table 1 and Table 2.

7.2 Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in test.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

Table 1 Requirements for Pig Feeds

(*Clauses* 4.3 *and* 7.1)

Sl No.	Characteristic	Requirements			Method of Test, Ref to
		Pig Starter/ Creep Feed	Pig Growth Meal	Pig Finishing/ Breeding Meal	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Moisture, percent by mass, *Max*	11.0	11.0	11.0	**4** of IS 7874 (Part 1)
ii)	Crude protein (N × 6.25), percent by mass, *Min*	20.0	18.0	18.0	IS/ISO 5983 (Part 1)* or IS 5983 (Part 2) or ISO 16634-1
iii)	Crude fat or ether extract, percent by mass, *Min*	2.0	2.0	2.0	IS/ISO 6492
iv)	Crude fibre, percent by mass, *Max*	6.0	8.0	12.0	IS/ISO 6865
v)	Total ash, percent by mass, *Max*	8.0	8.0	8.0	**9** of IS 7874 (Part 1)
vi)	Acid insoluble ash, percent by mass, *Max*	4.0	4.0	4.0	Annex A of IS 1712 or IS 14826*
vii)	Metabolizable energy (kcal/kg), *Min*	3 360	3 170	3 170	Annex C
viii)	Aflatoxin B_1 (ppb), *Max*	20.0	20.0	20.0	IS/ISO 14718* or IS 18143 or AOAC 2003.02

NOTES

1 The values specified for requirements (ii) to (viii) are on moisture free basis.

2 In case of dispute, the test methods given above and wherever indicated by '*' shall be the referee method.

3 Annex C for determination of metabolizable energy (ME) is given for guidance only. The manufacturer shall maintain record of calculated values of ME.

Table 2 Requirements for pig feeds to be declared

(*Clauses* 4.4, 5.2.1 *and* 7.1)

Sl No.	Characteristic	Requirements			Method of Test, Ref to
		Pig Starter/Creep Feed	Pig Growth Meal	Pig Finishing/ Breeding Meal	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Calcium (Ca), percent by mass, *Min*	0.6	0.6	0.6	IS 13433 (Part 1) or IS 15121* or EN 15621
ii)	Available phosphorous, percent by mass, *Min*	0.6	0.4	0.5	Annex F of IS 1374
iii)	Iron (as Fe), mg/kg, *Min*	100	90	80	IS 15121* or EN 15621
iv)	Copper, mg/kg, *Min*	8	6	6	IS 15121* or EN 15621
v)	Manganese, mg/kg, *Min*	30	30	20	IS 15121* or EN 15621
vi)	Zinc, mg/kg, *Min*	50	50	50	IS 15121* or EN 15621
vii)	Common salt (as NaCl), percent by mass, *Max*	0.5	0.5	0.5	**4** of IS 7874 (Part 2)

NOTE — The values specified for requirements (i) to (vii) are on moisture free basis.

Table 3 Requirements for Pig Feeds

(*Clause* 4.5)

Sl No.	Characteristic	Requirements		
		Pig Starter/Creep Feed	Pig Growth Meal	Pig Finishing/Breeding Meal
(1)	(2)	(3)	(4)	(5)
i)	Niacin, mg/kg, *Min*	17	14	10
ii)	Pantothenic acid, mg/kg, *Min*	11	10	10
iii)	Riboflavin, mg/kg, *Min*	3	2.4	2.2
iv)	Vitamin B_{12} activity, µg/kg, *Min*	15	11	11
v)	Vitamin A, IU/kg, *Min*	1 700	1 300	1 300
vi)	Vitamin D, IU/kg, *Min*	190	180	130

ANNEX A

(*Clause 2*)

LIST OF REFERRED STANDARDS

IS No./Other Publication	*Title*
IS 253 : 2014	Specification for common salt (*fourth revision*)
IS 1014 : 2023	Bone meal, steamed — Specification (*first revision*)
IS 1070 : 2023	Reagent grade water — Specification (*fourth revision*)
IS 1162 : 2021	Cane molasses — Specification (*first revision*)
IS 1712 : 2022	Cottonseed oilcake as livestock feed ingredient — Specification (*third revision*)
IS 1374 : 2024	Chicken feeds — Specification (*sixth revision*)
IS 1932 : 2022	Mustard and rapeseed oilcake as livestock feed ingredient — Specification (*third revision*)
IS 1934 : 2016	Sesamum oilcake as livestock feed ingredient — Specification (*second revision*)
IS 2052 : 2023	Compounded feeds for cattle — Specification (*fifth revision*)
IS 2151 : 2022	Maize germ oilcake as livestock feed ingredient — Specification (*second revision*)
IS 2152 : 2013	Maize gluten as livestock feed ingredient — Specification (*second revision*)
IS 2153 : 2022	Maize bran as livestock feed ingredient — Specification (*second revision*)
IS 2154 : 2014	Coconut oilcake as livestock feed ingredient — Specification (*third revision*)
IS 2239 : 2022	Wheat bran as livestock feed ingredient — Specification (*second revision*)
IS 3160 : 2022	Tur chuni as livestock feed ingredient — Specification (*first revision*)
IS 3161 : 2022	Gram chuni as livestock feed ingredient — Specification (*first revision*)
IS 3441 : 2022	Solvent extracted groundnut oil cake as livestock feed ingredient — Specification (*second revision*)
IS 3592 : 2024	Solvent extracted decorticated cottonseed meal (de-oiled cake) as livestock feed ingredient —
IS 3593 : 2022	Solvent extracted rice bran (de-oiled rice bran) as livestock feed — Specification (*third revision*)
IS 3648 : 2024	Rice bran as livestock feed ingredient — Specification (*second revision*)
IS 4193 : 2022	Guar meal as livestock feed ingredient — Specification (*second revision*)
IS 4307: 1983	Specification for fish meal as livestock feed ingredient (*second revision*)
IS 5065 : 1986	Specification for meat meal as livestock feed ingredient (*first revision*)
IS 5470 : 2002	Dicalcium phosphate, animal feed grade — Specification (*first revision*)
IS/ISO 5983	Animal feeding stuffs — Determination of nitrogen content and calculation of crude protein content:
(Part 1) : 2005	Kjeldahl Method
(Part 2) : 2021/ ISO 5983-2 : 2009	Block digestion and steam distillation method (*first revision*)
IS 6242 : 1985	Specification for solvent extracted undecorticated safflower oilcake as livestock feed ingredient (*first revision*)

IS No./Other Publication	*Title*
IS/ISO 6492 : 1999	Animal feeding stuffs — Determination of fat content
IS/ISO 6865 : 2000	Animal feeding stuffs — Determination of crude fibre content — Method with intermediate filtration
IS 7060 : 1973	Specification for blood meal as livestock feed
IS 7874	Methods of tests for animal feeds and feeding stuffs
(Part 1) : 1975	General methods
(Part 2) : 1975	Mineral and trace elements
IS 12829 : 2024	Mango seed kernels (solvent extracted) as livestock feed ingredient — Specification (*first revision*)
IS 13433 (Part 1) : 2024/ISO 6490-1 : 1985	Animal feeding stuffs — Determination of calcium content: Part 1 Titrimetric method (*first revision*)
IS/ISO 14718 : 1998	Animal feeding stuffs — Determination of Aflatoxin B_1 content of mixed feeding stuffs — Method using high-performance liquid chromatography
IS 14826 : 2021/ ISO 5985 : 2002	Animal feeding stuffs — Determination of ash insoluble in hydrochloric acid (*first revision*)
IS 15121 : 2002/ ISO 6869 : 2000	Animal feeding stuffs — Determination of the contents of calcium, copper, iron, magnesium, manganese, potassium, sodium and zinc — Method using atomic absorption spectrometry
IS/ISO 16634-1 : 2008	Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content: Part 1 Oilseeds and animal feeding stuffs
IS 18143 : 2023/ ISO 17375 : 2006	Animal feeding stuffs — Determination of aflatoxin B_1
EN 15621 : 2017	Animal feeding stuffs: Methods of sampling and analysis - Determination of calcium, sodium, phosphorus, magnesium, potassium, sulphur, iron, zinc, copper, manganese and cobalt after pressure digestion by ICP-AES

ANNEX B

(*Clause 4.2*)

INGREDIENTS FOR PIG FEEDS

B-1 GRAIN AND SEEDS

a) *Bajra, Bajri* (*Pennisetum typhoides*)

b) Barley (*Hordeurn vulgare*)

c) Black gram (*Phaseolus mungo*)

d) Broken rice paddy rice

e) *Chinna, Cheena* (*Panicum miliaceum*)

f) *Kulthi* or horse gram (*Dolichos biflorus*)

g) *Jowar,* Cholam(*Sorghum vulgare*)

h) Oats (*Avena sterilis*)

j) *Panwar* (*Cassiu tora*)

k) *Ragi* (*Eleusive coracana*)

m) Yellow maize

n) *Sawan* (*Echionochloa coIona*)

B-2 GRAIN BY-PRODUCTS

a) *Arhar chuni* (*see* IS 3160)

b) Black gram *chuni*

c) Gram *chuni* (*see* IS 3161)

d) Gram sievings

e) Maize bran (*see* IS 2153), maize gluten and maize gluten feed (*see* IS 2152)

f) Rice bran (*see* IS 3648) or solvent extracted rice bran (*see* IS 3593) and polishings

g) Wheat bran (*see* IS 2239)

B-3 OILCAKES AND MEALS

a) Copra cake, coconut cake (expeller-pressed or solvent extracted) (*see* IS 2154)

b) Cottonseed oilcake (decorticated) (expeller-pressed or solvent extracted)-up to 5 percent by mass (*see* IS 3592)

c) Groundnut oilcake (expeller-pressed or solvent extracted) (*see* IS 3441)

d) *Guar* (*Cyamopsis tetragonoloba*) — up to 5 percent by mass (*see* IS 4193)

e) Maize germ oilcake (*see* IS 2151)

f) Mustard oilcake — up to 5 percent by mass (*see* IS 1932)

g) Safflower (*Carthamus tinetorius*) cake (expeller-pressed or solvent extracted) (*see* IS 6242)

h) Sesamum (*Sesamun indicum orientale*) cake (expeller-pressed or solvent extracted) (*see* IS 1934)

B-4 TUBERS AND ROOTS

a) *Colocasia* stem and tubers

b) Potato — after boiling only

c) Sweet potato — after boiling only

d) Tapioca flour

e) Tapioca silage

B-5 ANIMAL PRODUCTS

a) Blood meal (*see* IS 7060)

b) Bone meal (*see* IS 1014)

c) Fish meal (*see* IS 4307)

d) Liver residue

e) Meat meal (*see* IS 5065)

NOTE — Biomass of animal origin may be used after adhering to suitable pre-processing techniques or rendering.

B-6 GREENS

a) *Ankasa* fodder (*Spilanthes acmella*)

b) Berseem (*Trifolium alexandrium*) leaf meal

c) Hybrid napier

d) Maize fodder

e) Moringa leaves (*Moringa oleifera*)

f) Lucerne (*Medicago sativa*) leaf meal

g) *Panwar* (*Cassia tora*) leaf meal

h) *Dhaincha* (*Sesbania grandfflore*) (dried)

j) Spinach (dried)

B-7 MINERALS, VITAMINS AND SUPPLEMENTS

a) Bone meal (steamed) (*see* IS 1014)

b) Common salt (*see* IS 253)

c) Dicalcium phosphate (fluorine content not to exceed 0.05 percent) (*see* IS 5470)

d) Limestone

e) Oyster shells

f) Vitamins (mineral-stablized)

B-8 WASTE MATERIALS AND INDUSTRIAL BY-PRODUCTS

a) Bakery waste — up to 50 percent of energy sources

b) Hatchery by-products, vegetable waste, rubber seed powder up to 10 percent level

c) Banana flower, banana stem, water hyacinth — up to 5 percent

d) *Azolla*, *Azar* and *Nahar* seed powder — up to 15 percent level

e) Brewers' grains

f) Dried yeast and yeast sludge

g) Mango seed kernel (*see* IS 12829)

h) *Mahua* flower residue

j) Molasses (*Khandsari* type) (*see* IS 1162)

k) Penicillin mycelium residue

m) Dried silkworm pupae

NOTE — Processed animal proteins may be used after ascertaining that the moisture content is brought down to prevent fungal growth and biosecurity concerns are addressed.

ANNEX C

[*Table* 1, *Sl No.* (vii)]

DETERMINATION OF METABOLIZABLE ENERGY (ME)

C-1 APPARATUS

C-1.1 Brooder — battery or floor type

C-1.2 Glass Bottles — stoppered, wide-mouthed

C-2 REAGENTS

C-2.1 Acetic Acid — 2 percent

C-2.2 Sulphuric Acid — 5 percent

C-3 PROCEDURE

C-3.1 Place 25 three-week old healthy chicks (white leghorn or Rhode Island Red) in a brooder and rear them on the experimental feed for 8 day acclimatization period. Then on the second day of the fifth week, give the chicks the requisite amount of accurately weighed experimental feed at a fixed hour in the morning. Simultaneously, spread the polyethylene sheets on the faeces trays for the collection of excreta. Collect a representative sample of feed for dry matter percentage and proximate analysis. Next day at the same hour collect the remaining feed and the faeces excreted and weigh them. A representative sample of the remaining feed is again collected for dry matter percentage. The difference in dry mass of feed offered, and the remaining feed gives the amount of dry matter consumed during 24 h. Collect the aliquots from excreta, after mixing it well, for dry matter and nitrogen estimation separately (one-twenty and one-hundred parts respectively) in wide mouthed and glass-stoppered bottles, and keep them in a refrigerator. For nitrogen estimation, samples in duplicate should be preserved in 5 percent sulphuric acid.

NOTE — The age of the birds during the collection period may vary from 5 to 10 weeks, but this does not affect the ME value significantly.

C-3.2 Repeat the same procedure on the next two alternate days and pool together the three-day samples of excreta for the analysis. For dry matter estimation, add about 10 ml of 2 percent acetic acid for every 50 g of the excreta and dry it in an oven at about 80 °C till constant mass is obtained. Find out the total dry matter voided in three days.

C-3.3 Analyze the samples of feed and the excreta for their crude protein, ether extract, total ash and total carbohydrate content. Calculate on dry matter basis.

C-4 CALCULATION

C-4.1 Calculate gross calories in feed and excreta. The calorific values of crude protein, ether extract and total carbohydrates are 5.65, 9.40 and 4.15 Cal/g respectively.

$$\text{Metabolizable energy per kg} = (E\ diet - E\ excreta - N \times 8.22)$$

where

$E\ diet$ = gross calories per g of feed (dry matter);

$E\ excreta$ = gross calories in excreta per, g of the feed (dry matter) consumed; and

N = nitrogen retention in g per g of feed (dry matter) consumed. This is obtained by subtracting total nitrogen excreted from the total nitrogen consumed per gram of the feed (dry matter).

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Animal Feeds and Nutrition Sectional Committee, FAD 05

Organization	*Representative(s)*
ICAR - Indian Veterinary Research Institute, Izzatnagar	DR TRIVENI DUTT **(*Chairperson*)**
All India Poultry Breeders Association, New Delhi	DR GAJANAN PADMAWAR SHRI RICKY THAPER (*Alternate*)
Animal Welfare Board of India, Faridabad	DR PRACHI JAIN DR DEBALINA MITRA (*Alternate*)
Association of Indian Pet Food Manufacturers, New Delhi	DR AKANKSHA SINGH SHRI GOVIND SURYAWANSHI (*Alternate*)
Centre for Science and Environment, New Delhi	SHRI AMIT KHURANA
Compound Livestock Feed Manufacturers Association of India, Navi Mumbai	PROF (DR) A. S. RANADE DR R. S. MASALI (*Alternate*)
CSIR - Central Drug Research Institute, Lucknow	DR RAJDEEP GUHA DR DHANANJAY HANSDA (*Alternate*)
Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Anjora	DR SANJAY SHAKYA DR MANOJ KUMAR GENDLEY (*Alternate*)
Department of Animal Husbandry and Dairying (DAHD), New Delhi	DR H. R. KHANNA DR SUJIT NAYAK (*Alternate* I) DR ANI BENCY JACOB (*Alternate* II)
Department of Animal Husbandry and Dairying, Panchkula	DR BIRENDER SINGH LAURA DR RAJESH DALAL (*Alternate)*
Food Safety and Standards Authority of India, New Delhi	MS GEETIKA
Guru Angad Dev Veterinary and Animal Sciences, University, Ludhiana	DR J. S. LAMBA DR JASMINE KAUR (*Alternate*)
ICAR - Central Avian Research Centre, Bareilly	DR ASHOK KUMAR TIWARI DR JAYDEEP ROKADE (*Alternate*)
ICAR - Central Institute for Research on Buffaloes, Hisar	DR P. C. LAILER DR AVIJIT DEY (*Alternate*)
ICAR - Central Sheep and Wool Research Institute, Avikanagar	DR RANDHIR SINGH BHATT DR SROBANA SARKAR (*Alternate*)
ICAR - Directorate of Poultry Research, Hyderabad	DR R. N. CHATTERJEE DR S. V. RAMA RAO (*Alternate* I) DR M. V. L .N. RAJU (*Alternate* II)
ICAR - Indian Veterinary Research Institute, Izzatnagar	DR L. C. CHAUDHARY DR A. K. VERMA (*Alternate*)
ICAR - National Institute of Animal Nutrition and Physiology, Bengaluru	DR RAGHAVENDRA BHATTA DR D. T. PAL (*Alternate*)
ICAR - National Research Centre on Equines, Hisar	DR S. C. MEHTA DR R. A. LEGHA (*Alternate*)
ICAR - National Research Centre on Pig, Guwahati	DR NITIN M. ATTUPURAM DR JUWAR DOLEY (*Alternate*)

Organization	*Representative(s)*
Indian Federation of Animal Health Companies, Mumbai	DR SHIRISH NIGAM DR VIJAY MAKHIJA (*Alternate*)
Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar	DR H. S. MADHUSUDHAN SHRI N. K. SHIVAKUMAR GOWDA (*Alternate*)
Ministry of Fisheries, Animal Husbandry and Dairying, Department of Animal Husbandry and Dairying, New Delhi	DR H. R. KHANNA DR SUJIT NAYAK (*Alternate* I) DR ANI BENCY JACOB (*Alternate* II)
National Dairy Development Board, Anand	DR RAJESH SHARMA DR PANKAJ L. SHERASIA (*Alternate*)
National Dairy Research Institute, Karnal	DR NITIN TYAGI DR SACHIN KUMAR (*Alternate*)
National Egg Coordination Committee, New Delhi	SHRI AJIT SINGH SHRI BHAGWATI SINGH (*Alternate*)
NDDB CALF Limited, Anand	DR RAJESH NAIR SHRI SHASHIKANT GUPTA (*Alternate*)
Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan (DUVASU), Mathura	PROF (DR) P. K. SHUKLA DR VINOD KUMAR (*Alternate*)
People for Animals, New Delhi	MS GAURI MAULEKHI MS SHREYA PAROPKARI (*Alternate*)
PETA India, Mumbai	DR KIRAN AHUJA DR BANDHANPREET KAUR (*Alternate*)
Poultry Federation of India, Sonipat	SHRI RANPAL DHANDA SHRI RAHUL KHATRI (*Alternate*)
Tamil Nadu Veterinary and Animal Sciences University, Chennai	DR A. NATRAJAN DR R. RAJENDRAN (*Alternate*)
In Personal Capacity (*1/3 Jasmine Street, Smart Resort, Kuldiha, Durgapur - 713212*)	DR A. B. MANDAL
BIS Directorate General	SHRIMATI SUNEETI TOTEJA, SCIENTIST 'F'/SENIOR DIRECTOR AND HEAD (FOOD AND AGRICULTURE) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
SHRIMATI NITASHA DOGER
SCIENTIST 'E'/ DIRECTOR
(FOOD AND AGRICULTURE), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: FAD 05 (23752).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: 5th Floor/MTNL CETTM Technology Street, Hiranandani Gardens, Powai, Mumbai - 400076	25700030 25702715

Branches : AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HARYANA (CHANDIGARH), HUBLI, HYDERABAD, JAIPUR, JAMMU, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PARWANOO, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VIJAYAWADA.

Published by BIS, New Delhi