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BUREAU OF INDIAN STANDARDS**MINUTES**

Name of the Committee	No. of Meeting	Date & Time	Venue
Animal Feeds and Nutrition Sectional Committee, FAD 5	27th	9 Sep 2024 Monday @ 1030 hrs	Samvaad (Green room), Manak Bhawan, BIS Hqrs, New Delhi (Hybrid)

CHAIRMAN:

Dr. Triveni Dutt
(Chairman, FAD 5)
Director,
ICAR-Indian Veterinary Research Institute (IVRI),
Izzatnagar, Bareilly

MEMBER SECRETARY:

Nitasha Doger
(Member Secretary, FAD 5)
Scientist-E
Food & Agriculture Department,
Bureau of Indian Standards, New Delhi

ATTENDANCE SHEET– Please see *Annex-A* (Page 11)

Item 0 GENERAL**0.1 Welcome**

Mrs. Nitasha Doger, Member Secretary FAD 5 extended a warm welcome to the Chairperson and the members of Animal Feeds and Nutrition Sectional Committee, FAD 5 to its 27th meeting and thanked them for sparing their valuable time for supporting BIS, the National Standards Body of India in its pursuit of standardization.

She apprised the members about the work done by the committee since its last meeting and expressed gratitude towards the members of the committee for their efforts and contribution in committee's work.

0.2 Appointment of New Chairperson of FAD 5

Mrs. Nitasha informed the Committee about the appointment of Dr. Triveni Dutt, Director, ICAR-IVRI as the new Chairperson of FAD 5 and extended a warm welcome to him on behalf of the Committee.

The Committee placed on record its appreciation for the contribution made by Dr. R. K. Singh, previous Chairman, FAD 5 for standardization in the field of animal feeds and nutrition.

0.3 Opening Remarks by the Chairman, FAD 5

Dr. Triveni Dutt, extended a warm welcome to the members of the Committee to its 27th meeting. The Chairman in his opening remarks, appreciated the committee for formulating relevant standards in the field of animal feeds and important developments being made under the Committee. The Chairman encouraged the members for their active contribution in

Committee's work and urged them for fruitful discussions during the meeting.

ITEM 1 CONFIRMATION OF THE MINUTES OF THE LAST MEETING

The Committee confirmed the minutes of the last (26th) meeting of Animal Feeds and Nutrition Sectional Committee, FAD 5 held on 22 March 2024 as circulated vide our email dated 24 April 2024.

Item 2 SCOPE, ACTIVITIES & COMPOSITION OF THE SECTIONAL COMMITTEE

2.1 SCOPE & PROGRAM OF WORK OF THE COMMITTEE

The Committee noted the information given in Agenda Item **2.1** regarding the scope & activities of the Committee.

2.2 COMPOSITION OF THE SECTIONAL COMMITTEE

2.2.1 The Committee reviewed the updated composition of FAD 5 along with the attendance record of the last three meetings including the attendance in 27th meeting and expressed satisfaction on active participation of members in committee meetings.

2.2.2 The Committee further reviewed the composition of various Panels under FAD 5 provided under **Annex III** of the agenda and decided to make following updations in the expert panels:

- (i) To indicate the name of Dr. A Natarajan and Dr. A. K. Verma as experts in personal capacities (consequent upon their superannuation from their organizations) in the respective panels where they are representing.
- (ii) To include the name of Dr. P. Vasan in Expert Panel on poultry feed and related standards (FAD 5/Panel 10).

ITEM 3 INDIAN STANDARDS PUBLISHED/ UNDER PRINT

The Committee noted the information given under agenda item 3 regarding Indian standards published since the last meeting of the committee along with standards under print and appreciated the work done by the Committee.

ITEM 4 DRAFT INDIAN STANDARDS COMPLETED/ UNDER WIDE CIRCULATION

4.1 Doc. No. FAD 05 (23752) C, Pig feeds — Specification (*second revision of IS 7472*)

The Committee noted that the comments from People for Animals (PFA), New Delhi on the draft were discussed by the working group (FAD 5/ WG 1) during its meetings held on on **21-6-2024** and **29-08-2024**. The Committee endorsed the recommendations of the WG given in the report of the panel provided as Annex IV of the agenda and decided to finalize the WC draft for publication incorporating changes recommended by the panel.

4.2 Doc. No. FAD 05 (22003) C, Compounded feed for pregnant cows and buffaloes — Specification

The Committee noted that the document was issued into wide circulation for 60 days with last date of comments on 15 Sep 2024 and encouraged the members to actively comment on the document before the last date of comment.

ITEM 5 COMMENTS FROM RELIANCE INDUSTRIES LIMITED ON IS 11968: 2019, PET FOOD FOR DOGS AND CATS – SPECIFICATION AND IS 1374 : 2024, CHICKEN FEEDS — SPECIFICATION

The Committee deliberated on the comments from M/s_Reliance Industries Limited on IS 11968: 2019, Pet food for dogs and cats - Specification (*first revision*) and IS 1374 : 2024, Chicken feeds — Specification (*fifth revision*) received through BIS standards portal (on 22-04-2024). The Committee also considered the documents submitted by the M/s_Reliance Industries Limited relating to ‘green marine microalgal biomass’ which was placed before the committee in its previous meetings (25th and 26th).

The Committee observed that in their proposal they have mentioned that the green marine microalgae biomass is a byproduct after protein removal that they intend to use as an ingredient in pet food/ poultry feed. Whereas the FSSAI approval shared by them is for the “Algae Protein Powder” under category 12.10 (Protein Products other than from Soybeans) intended to be used as an ingredient in processed foods. Therefore, FSSAI approval is not relevance here. Further, considering that ‘green marine microalgal biomass’ is a byproduct after protein removal, it is important to understand nutrient profile of such product and, purpose and benefit of using such product as a feed ingredient.

The Committee was of the view that the information provided with the proposal is not sufficient and decided to seek following information from M/s Reliance Industries Ltd for considering their proposal:

- (i) Nutrient profile of the product including, omega 3 fatty acids, potassium and iron content with supporting technical data/ study on nutrient utilization and digestibility of marine microalga biomass when incorporated in Chicken feed/ Pet food.
- (ii) Experimental studies/ data on *in vivo* trial of use of ‘green marine microalgal biomass’ in Chicken feed and Pet food
- (iii) Technical data/ study on presence of heavy metal like lead, arsenic and mercury in the algal biomass/meal and the residual accumulation level of these metals in edible portion.
- (iv) Screening for anti-nutritional factors like nucleotides and its level.

ITEM 6 ACTIONS ARISING OUT OF PREVIOUS MEETING:

The Committee considered Item 6 of the agenda and decided as under:

Sl. No.	Ref. Clause in minutes of 26 th meeting of FAD 5 & Decision of the Committee	Action taken/ Status	Decision of the Committee
1.	<p>Item 6 New work item proposals for standardization: Monocalcium phosphate, Animal feed grade – Specification</p> <p>The Committee decided to take up formulation of Indian standard on Monocalcium Phosphate, Animal Feed Grade-Specification and refer the project to the Expert Panel 11 to initiate work on the same in consultation with the proposer (DCP, Rock Base Manufactures Association) for necessary technical inputs.</p>	<p>Meeting of Expert Panel 11 was held on 9 June 2024. The panel deliberated that as per the available data/review, MCP is used mainly (>95%) in poultry/aqua feeds, whereas very small amount is used by the cattle feed industry. In view of this, the panel has recommended to move this new work item to poultry panel (Panel 10 of FAD 5) for better deliberation and drafting a suitable specification on MCP.</p>	<p>The Committee considered the recommendation of Expert Panel 11 and decided to transfer the subject 'Monocalcium Phosphate, Animal Feed Grade-Specification' for formulation of Indian standard from Expert Panel on Cattle Feed and Feed Ingredients (FAD 5/ Panel 11) to Expert Panel on Poultry Feed and related standards (FAD 5/ Panel 10) considering more relevance of the subject in poultry sector. The Committee requested Panel 10 to initiate work on the same in consultation with the proposer (DCP, Rock Base Manufactures Association) for necessary technical inputs.</p>
2.	<p>Item 8, Sl. No. 1 Review of Test Method Prescribed for Determination of Sulphur in IS 1664: 2002, Mineral Mixtures for Supplementing Cattle Feeds - Specification (Fourth Revision)</p> <p>The Committee referred to the ambiguity pointed out in the test method prescribed for determination of Sulphur in IS 1664 in its 24th meeting.</p> <p>The Committee again requested TANUVAS and IVRI to</p>	<p>Inputs awaited in the matter.</p>	<p>The Committee decided to take up review of test methods in IS 1664: 2002, Mineral Mixtures for Supplementing Cattle Feeds - Specification (Fourth Revision) — Specification and constituted following Working group to review IS 1664: 2002 and submit its recommendation to the committee in three months' time:</p> <p>(i) Dr. Sunil E. Jadav, IVRI – Convenor</p>

	expeditiously examine the ambiguity in the test and give their recommendation in the matter. The Committee also requested BIS secretariat to follow up with Central Lab, BIS and Vimta labs, Hyderabad in the matter.		(ii) Dr. Shashikant Gupta, NDDDB CALF (iii) Dr. R.S. Masali, CLFMA (iv) Nominated representative from NIANP, Bengaluru (v) Nominated representative from NDRI, Karnal
3.	<p><u>Item 8, Sl. No. 2 Review of 11968:2019, Pet Food for Dogs and Cats — Specification</u></p> <p>Review of IS 11968:2019 has been undertaken by the expert panel constituted during 25th meeting of the committee for review and preparation of draft revision of IS 11968: 2019 comprising of: (i) Dr Akanksha Singh, Association of Indian Pet Food Manufacturers – Convenor (ii) Dr H S Madhusudhan — Karnataka Veterinary, Animal and Fisheries University, Bengaluru (iii) Dr Umesh Kallahalli — In personal capacity (iv) Dr. A K Pattanaik – In personal capacity (v) Shreya Pandey — - CIFTI-FICCI.</p> <p>The first meeting of the panel was held on 18 Dec 2023. The Committee in its 26th meeting requested the Expert Panel to submit the ARP report along with draft revision in 3 months' time.</p>	Review of IS 11968:2019 is ongoing. Second meeting of the Panel to review the standard was held on 27 August 2024 and the report was provided as Annex VII of the agenda.	The Committee considered that the review of IS 11968:2019 is ongoing under the concerned working group and requested the WG to ensure submission of final report with draft revision document by the end of November 2024.
4.	<p><u>Item 8, Sl. No. 3 NWIPs on Feed and Feed Ingredients</u></p> <p>Following new work item proposals are allocated to Expert Panel FAD 5/ Panel 11 on Feed and Feed Ingredients for preparation of preliminary draft: (i) Silage or Corn Silage as Livestock Fodder (ii) De-Potash Vinasse (iii) Seaweed-Based Feed Supplement (iv) Algae Biomass (Non-Specified Ingredient) as Animal Feed (v) Distiller's Dried Grains with Solubles.</p>	Meeting of Expert Panel 11 was held on 9 June 2024 where the panel deliberated upon the requirements to be specified in new standards and recommended table of contents for DDGS and Maize or Corn Silage as Livestock Fodder.	The committee considered the draft requirements recommended by the FAD 5/ Panel 11 for (i) Distiller's Dried Grains with Solubles and (ii) Maize or Corn Silage as Livestock Fodder and requested the convenor of the Panel to provide preliminary draft Indian standards for these two subjects along with necessary background technical documents. The Committee decided that BIS secretariat may then process these drafts for circulation

	<p>The Committee considered that a substantial number of drafts are to be prepared by Panel 11 which would involve significant work and therefore there is a need for prioritization.</p> <p>The Committee accordingly decided to prioritize the subjects in following order:</p> <ul style="list-style-type: none"> (i) Distiller's Dried Grains with Solubles (ii) Maize or Corn Silage as Livestock Fodder (iii) De-Potash Vinasse (iv) Seaweed-Based Feed Supplement (v) Algae Biomass (Non-Specified Ingredient) as Animal Feed <p>The Committee requested the Expert Panel to expedite the work given to them as per the above priority.</p>	<p>Minutes of meeting provided as Annex VI of the agenda.</p>	<p>amongst the committee members as P draft with 30 days commenting period with the approval of Chairman FAD 5.</p> <p>The Committee further decided to transfer the subject for 'Algae Biomass (Non-Specified Ingredient) as Animal Feed' for formulation of Indian standard from Expert Panel on Cattle Feed and Feed Ingredients (FAD 5/ Panel 11) to Expert Panel on Poultry Feed and related standards (FAD 5/ Panel 10) considering more relevance of the subject in poultry sector. The Panel may initiate work on the subject after receipt of necessary technical inputs from the proposer. <i>(Please also see decision of the committee at Item 5).</i></p>
<p>5.</p>	<p><u>Item 8, Sl. No. 4</u> NWIPs on test methods</p> <p>Following new work item proposals are allocated to Expert Panel FAD 5/ Panel 13 on test methods to expedite preparation of preliminary draft on the following subjects: (i) Testing procedure for Available Phosphorus in Cattle Feed (ii) Test Method for Determination of Non- Protein Nitrogen in Animal Feeding Stuffs. The Committee requested the panel to review the need for R &D projects under BIS funding.</p> <p>The Committee requested Dr. Rajesh Nair, NDDB, CALF Lab to convene early meetings of the panel to expedite the task assigned to the panel.</p>	<p>Preliminary drafts awaited from FAD 5/ Panel 13.</p>	<p>The Committee requested the expert panel to convene early meetings of the panel to expedite the task assigned to the panel.</p>
<p>6.</p>	<p><u>Item 8, Sl. No. 5</u> NWIP on Compounded feeds for Sheep & Goat</p> <p>The Committee requested Dr. Randhir Singh Bhatt for early</p>	<p>Preliminary draft received from from Dr. Randhir Singh Bhatt provided as Annex VIII of the agenda.</p>	<p>The Committee considered the preliminary draft prepared by Dr. Randhir Singh Bhatt, CSWRI on 'Compounded feeds for Sheep' and requested Dr. Bhatt to provide necessary</p>

	<p>submission of the preliminary draft on the subject for further deliberations by the committee. The Committee requested Dr. Randhir Singh Bhatt complete the assigned task in 3 months' time.</p>		<p>background technical documents/references based on which the draft has been prepared. The Committee decided that BIS secretariat may then process the draft for circulation amongst the committee members as P draft with 30 days commenting period with the approval of Chairman FAD 5.</p> <p>The Committee further decided that 'Compounded feeds for Goat' may be taken up as a separate subject for standard development and to be deliberated upon in next meeting.</p>						
7.	<p>Item 8, Sl. No. 6 Review of IS 10672 : 1983 Specification for Mineral Mixtures for Supplementing Sheep and Goat Feeds:</p> <p>The Committee requested Dr. Randhir Singh Bhatt for early submission of the draft revision of IS 10672 on the subject for further deliberations by the committee.</p>	<p>Draft revision of IS 10672 has been submitted by Dr. Randhir Singh Bhatt. The same was provided as Annex IX of the agenda.</p>	<p>The Committee considered the draft revision of IS 10672 prepared by Dr. Randhir Singh Bhatt, CSWRI and requested Dr. Bhatt to provide report identifying the changes proposed in the standard along with necessary technical justification/ references. The Committee also decided that inputs from Central Institute for Research on Goats (CIRG) may also be sought on the draft revision before processing the draft for wide circulation.</p>						
8.	<p>Item 8, Sl. No. 7 Review of pending f Pre-2000 standard: The Committee requested the expert panels to expedite the work for completing the review of following Pre-2000 standard pending with them:</p> <table border="1" data-bbox="230 1214 1043 1383"> <thead> <tr> <th data-bbox="230 1214 495 1318">Concerned Expert Panel</th> <th data-bbox="495 1214 629 1318">IS No.</th> <th data-bbox="629 1214 1043 1318">Title</th> </tr> </thead> <tbody> <tr> <td data-bbox="230 1318 495 1383">Expert panel (FAD 5/ Panel 11)</td> <td data-bbox="495 1318 629 1383">IS 920 : 1972</td> <td data-bbox="629 1318 1043 1383">Specification for common salt and cattle licks for animal</td> </tr> </tbody> </table>	Concerned Expert Panel	IS No.	Title	Expert panel (FAD 5/ Panel 11)	IS 920 : 1972	Specification for common salt and cattle licks for animal	<p>Expert Panel FAD 05/ P10 on Poultry Feed and related standards examined and reviewed the poultry feed related standards during its meeting held on 7 June 2024, (through WebEx). Report of the Panel provided as Annex</p>	<p>The Committee considered the recommendation of the FAD 5/ Panel 10 provided as Annex IV of the agenda for revision of IS 9863:1992, Nutrient requirements for poultry and IS 5672 :1992, Mineral mixture for supplementing poultry feeds along with the recommendation from Vimta labs for updations of the test methods. The Committee advised that BIS secretariat</p>
Concerned Expert Panel	IS No.	Title							
Expert panel (FAD 5/ Panel 11)	IS 920 : 1972	Specification for common salt and cattle licks for animal							

on cattle feed and feed ingredients	IS 14275 : 1995	consumption (<i>First Revision</i>) Technical requirements for urea molasses liquid drought feed for cattle	X of the agenda.	may prepare draft revision for these two standards incorporating the suggested changes and process these drafts for wide circulation with 60 days commenting period with the approval of Chairman FAD 5.
Expert panel (FAD 5/ Panel 10) on poultry feed and related standards	IS 1942 : 1968	Specification for bone - meal as poultry feed supplement (<i>First Revision</i>)	The panel in their recommendation have suggested revision of certain parameters in Standards; IS 9863:1992 (Nutrient requirements for poultry) and IS 5672 :1992 (Mineral mixture for supplementing poultry feeds). Whereas, for other standards (Fish meal, Bone meal, meat meal, blood meal and silkworm pupae meal), the panel has recommended to retain the existing specified values. The Panel has recommended that methods of test need to be updated in all the specifications. For this, inputs received from Dr Jagadeesh of Vimta labs were provided with the agenda as Annex XI.	The Committee considered the recommendation of the panel to retain the existing specified values in IS 1942: 1968, Specification for bone - meal as poultry feed supplement, IS 4307 : 1983, Specification for fish meal as poultry feed ingredient, IS 5065 : 1986, Specification for meat meal as poultry feed ingredient, IS 6107 : 1971, Specification for dried silk worm pupae as poultry feed and IS 7060 : 1973, Specification for blood meal as poultry feed and decided to revise these standard for updations of test methods only. The Committee advised that BIS secretariat may prepare draft revision for these standards incorporating the changes suggested by Vimta labs and process these drafts for wide circulation with 60 days commenting period with the approval of Chairman FAD 5.
	IS 4307 : 1983	Specification for fish meal as poultry feed ingredient (<i>Second Revision</i>)		
	IS 5065 : 1986	Specification for meat meal as poultry feed ingredient (<i>First Revision</i>)		
	IS 5672 : 1992	Mineral mixtures for supplementing poultry feeds — Specification (<i>First Revision</i>)		
	IS 6107 : 1971	Specification for dried silk worm pupae as poultry feed		
	IS 7060 : 1973	Specification for blood meal as poultry feed		
	IS 9863 : 1992	Nutrient requirements for poultry (<i>First Revision</i>)		
Expert panel (FAD 5/ Panel 13) on test methods standards under FAD 5	IS 7874 (Part 1) : 1975	Methods of tests for animal feeds and feeding stuffs Part 1 general methods	Progress report from other panels in the matter is awaited from Conveners of the respective panels.	The Committee requested the other experts panels to complete the assigned task for review of remaining Pre- 2000 standards in 3 months' time.
	IS 7874 (Part 2) : 1975	Methods of tests for animal feeds and feeding stuffs Part 2 minerals and trace elements		

ITEM 7 REVIEW OF INDIAN STANDARDS

The Committee reviewed the list of Indian standards due for Review as per 5 Yearly Review Criteria during 2024-25 and decided as follows:

SI No.	IS No.	Title	Decision of the Committee
1.	IS 10672 : 1983	Specification for mineral mixtures for supplementing sheep and goat feeds	To reaffirm and revise (revision under progress)
2.	IS 14275 : 1995	Technical requirements for urea molasses liquid drought feed for cattle	To reaffirm and revise (revision under progress)
3.	IS 1942 : 1968	Specification for bone — Meal as poultry feed supplement (<i>first revision</i>)	To reaffirm and revise. (revision under progress)
4.	IS 4307 : 1983	Specification for fish meal as livestock feed ingredient (<i>second revision</i>)	To reaffirm and revise (revision under progress)
5.	IS 5672 : 1992	Mineral mixtures for supplementing poultry feeds — Specification (<i>first revision</i>)	To reaffirm and revise (revision under progress)
6.	IS 6107 : 1971	Specification for dried silk worm pupae as livestock feed	To reaffirm and revise (revision under progress)
7.	IS 7060 : 1973	Specification for blood meal as livestock feed	To reaffirm and revise (revision under progress)
8.	IS 7874 (Part 1) : 1975	Methods of tests for animal feeds and feeding stuffs: Part 1 General methods	To reaffirm and revise
9.	IS 7874 (Part 2) : 1975	Methods of tests for animal feeds and feeding stuffs: Part 2 Minerals and trace elements	To reaffirm and revise
10.	IS 7874 (Part 3) : 2020	Methods of Tests for Animal Feeds and Feeding Stuffs Part 3 Microbiological Methods (<i>first revision</i>)	To reaffirm (The Committee considered that the standard is relatively new and no comments have been received on the standard)

ITEM 8 INTERNATIONAL ACTIVITIES

The committee noted the information given under item **8.1 and 8.2** and assured effective participation at International level. BIS Secretariat encouraged the members to submit New Work Item Proposal (NWIP) for development of international standards at ISO level and to

advance international engagement and participation in standardization at international level.

ITEM 9 TIME AND PLACE FOR THE NEXT MEETING

The Committee noted that its next meeting is scheduled for **11 March 2025**, as per the annual meeting calendar, and decided to hold the meeting according to the established schedule on a best endeavor basis.

ITEM 10 ANY OTHER BUSINESS

There being no other business, the meeting ended with a hearty vote of thanks to the Chair & the members.

*Annex A***Attendance for the 27th meeting of Animal Feeds and Nutrition Sectional Committee, FAD 5 held on 9 Sep 2024**

Sl No.	Organization	Representative
1.	Dr. Triveni Dutt* Chairman FAD 05 & Director of ICAR- Indian Veterinary Research Institute (IVRI), Izatnagar	
2.	All India Poultry Breeders Association, New Delhi	Mr. Ricky Thaper*
3.	Animal Welfare Board of India, Faridabad	Dr. Prachi Jain
4.	Association of Indian Pet Food Manufacturers, New Delhi	Dr Akanksha Singh* Mr. Govind Suryawanshi*
5.	CSIR - Central Drug Research Institute (CDRI), Lucknow	Dr. Rajdeep Guha
6.	Centre for Science and Environment (CSE), New Delhi	Shri Amit Khurana
7.	Compound Livestock Feed Manufacturers Association of India (CLFMA), Navi Mumbai	Prof. Dr. A. S. Ranade Dr. R.S. Masali
8.	Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Anjora	Dr. Sanjay Shakya Dr. Manoj Kumar Gendley
9.	Department of Animal Husbandry and Dairying, Haryana, Panchkula	Dr. Dharamvir
10.	Food Safety and Standards Authority of India (FSSAI), New Delhi	Ms. Geetika
11.	Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana	Dr. Jasmine Kaur
12.	ICAR-Central Avian Research Centre, Bareilly	Dr. Chandra Deo Dr. Ashok Kumar Tiwari Dr. Rokade Jaydip Jaywant
13.	ICAR-Central Institute for Research on Buffaloes (CIRB), Hisar	Dr. Avijit Dey
14.	ICAR- Central Sheep and Wool Research Centre (CSWRI), Avikanagar, Rajasthan	Dr. Randhir Singh Bhatt
15.	ICAR - Directorate of Poultry Research (DPR), Hyderabad	Dr. M.V.L.N. Raju
16.	ICAR - Indian Veterinary Research Institute (IVRI), Izatnagar	Dr. L C Chaudhary*
17.	ICAR-National Research Centre on Equines, Hisar	Dr. S. C. Mehta
18.	ICAR-National Research Centre on Pig, Guwahati	Dr. Nitin M. Attupuram
19.	Indian Federation of Animal Health Companies (INFAH)	Dr. Shirish Nigam
20.	Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar	Dr. H. S. Madhusudhan Dr. N. K. Shivakumar Gowda
21.	Ministry of Fisheries, Animal Husbandry and Dairying, Department of Animal Husbandry and Dairying, New Delhi	Dr. Ani Bency Jacob
22.	NDDB CALF Limited, Anand	Dr. Shashikant Gupta
23.	National Dairy Development Board NDDB, Anand	Dr Pankaj Sherasia Dr. Rajesh Sharma
24.	National Egg Coordination Committee (NECC), Chandigarh	Shri Ajit Singh* Shri Bhagwati Singh*

25.	National Institute of Animal Nutrition and Physiology, Bengaluru	Dr. D. T. Pal
26.	PETA India, Mumbai	Dr. Kiran Ahuja
27.	People for Animals (PFA), New Delhi	Ms. Gauri Mulekhi * Ms. Sunayana Sibal*
28.	Poultry Federation of India (PFI)	Shri Ranpal Dhanda Shri Rahul Khatri
29.	Tamil Nadu Veterinary and Animal Sciences University, Chennai	Dr. P. Vasan
30.	Pandit Deen Dayal Upadhyaya Pashu Chikitsa Vigyan Vishwavidyalaya Evam Go-Anusandhan Sansthan (DUVASU), Mathura	Prof. (Dr.) P. K. Shukla
31.	<i>In Personal Capacity</i>	Dr. A. B. Mandal

**Physically present during the meeting*

3000 ME and 23% cp

Feed Ingredients		ME	CP	Ca	Total P	Ava. P	ME	CP	Ca	Total P	Ava. P
Maize	63.43	3390	10.74	0.02	0.283	0.08	2150.3	6.81	0.01	0.180	0.051
DORB	0	2000	15.75	0.008	1.68	0.241	0	0	0	0	0
SBM	32.4	2440	49.51	0.27	0.62	0.2	790.56	16.04	0.087	0.201	0.065
Seasame	0	2570	41	1.925	1.325	0.33	0	0	0	0	0
FM	0	2200	42.91	5.11	2.88	2.5	0	0	0	0	0
Veg. Oil	0.5	8600	0	0	0	0	43	0	0	0	0
DCP	0	0	0	23	18	18	0	0	0	0	0
LS	0	0	0	38	0	0	0	0	0	0	0
Mineral Mixture	3	0	0	26	9	9	0	0	0.78	0.27	0.27
A B2 D3	0.1	0	0	0	0	0	0	0	0	0	0
B-Complex	0.02	0	0	0	0	0	0	0	0	0	0
Choline Cl	0.1	0	0	0	0	0	0	0	0	0	0
Salt	0.3	0	0	0	0	0	0	0	0	0	0
Lys	0.1	4600	96.15	0	0	0	4.6	0.10	0	0	0
Meth	0.05	3680	58.69	0	0	0	1.84	0.03	0	0	0
Total	100						2990.3	22.98	0.880	0.650	0.386

3000 ME and 23% cp											
Feed Ingredints	%	ME	CP	Ca	Total P	Ava. P	ME	CP	Ca	Total P	Ava. P
Maize	64.33	3390	10.74	0.02	0.283	0.08	2180.8	6.91	0.013	0.182	0.051
DORB	0	2000	15.75	0.008	1.68	0.241	0	0	0	0	0
SBM	32.2	2440	49.51	0.27	0.62	0.2	785.68	15.94	0.087	0.200	0.064
Seasame	0	2570	41	1.925	1.325	0.33	0	0	0	0	0
FM	0	2200	42.91	5.11	2.88	2.5	0	0	0	0	0
Veg. Oil	0.3	8600	0	0	0	0	25.8	0	0	0	0
DCP	0	0	0	23	18	18	0	0	0	0	0
LS	0	0	0	38	0	0	0	0	0	0	0
Mineral Mixture	2.5	0	0	30	9	9	0	0	0.75	0.225	0.225
A B2 D3	0.1	0	0	0	0	0	0	0	0	0	0
B-Complex	0.02	0	0	0	0	0	0	0	0	0	0
Choline Cl	0.1	0	0	0	0	0	0	0	0	0	0
Salt	0.3	0	0	0	0	0	0	0	0	0	0
Lys	0.1	4600	96.15	0	0	0	4.6	0.10	0	0	0
Meth	0.05	3680	58.69	0	0	0	1.84	0.03	0	0	0
Total	100						2998.7	22.98	0.850	0.607	0.341

		content by 100kg		by source	MW		c by%	avaiable source	Content	Amount of to be added to get required level	Availability in 100 kg diet	per kg			
	Ca	26		CaCO3	100	ca	40	38	25.36129	66.74024	0.760839	0.78			
	P	9		Rock phosphate	1028	p	310	310	9	29.84516	0.27	0.225			
				Contribution from DCP		ca	40	40	0.63871		0.019161	By PPM			
	Iron	0.17		FeSO4 3H2O	206	fe	56	52	0.17	0.673462	0.0051	51			
	Iodine	0.008		KI	166	I	127	124	0.008	0.01071	0.00024	2.4			80
	copper	0.04		CuSO4 5H2O	249	Cu	63	61	0.04	0.163279	0.0012	12			400
	manganese	0.3		MnSO4	169	Mn	55	52	0.3	0.975	0.009	90			3000
	flurine	0.04			92		57	55	0.04	0.066909	0.0012	12			400
	Zinc	0.33		ZnSO4 7H2O	287	Zn	65	62	0.33	1.527581	0.0099	100			3300
	AIA	3													
									Total	100.0023	0				

		MW	caco3	CAHPO4 2H2O	feso4 3H2O	KI	CuSO4	Mn SO	ZnSO4 7H2O	ClF3	rock phosphate Ca10(PO4)F2				
	ca	40	1	1							1				
	p	31		1							10				
	s	32			1		1	1	1						
	o	16	3	6	7		9	5	11		40				
	c	12	1												
	h	1		5	6		10	2	14						
	fe	56			1										
	I	127				1									
	Zn	65							1						
	Cu	63					1								
	Mn	55						1							
	Fl	19								3	2				
	Cl	35								1					
	K	39				1									
		MW	100	172	206	166	249	169	287	92	###				

	content by 100kg	by source	MW	c by%	available source	Content	Amount of to be added to get required level	Availability in 100 kg diet	per kg
Ca	30	CaCO3	100	40	38	29.36129	77.26655	0.734032	0.75
P	9	Rock phosphate	1028	310	310	9	29.84516	0.225	0.225
		Contribution from DCP	ca	ca	40	40	0.63871	0.015968	By PPM
Iron	0.2	FeSO4 3H2O	206	56	52	0.2	0.792308	0.005	50
Iodine	0.01	KI	166	127	124	0.01	0.013387	0.00025	2.5
copper	0.05	CuSO4 5H2O	249	63	61	0.05	0.204098	0.00125	12.5
manganese	0.4	MnSO4	169	55	52	0.4	1.3	0.01	100
flurine	0.05		92	57	55	0.05	0.083636	0.00125	12.5
Zinc	0.4	ZnSO4 7H2O	287	65	62	0.4	1.851613	0.01	100
AIA	3								
						Total	111.3568	0	

	MW	caco3	CAHPO4 2H2O	feso4 3h2o	KI	CuSO4 5H2O	Mn SO4 H2O	ZnSO4 7H2O	ClF3	rock phosphate Ca10(PO4)F2		
ca	40	1	1							1		
p	31		1							10		
s	32			1		1	1	1				
o	16	3	6	7		9	5	11		40		
c	12	1										
h	1		5	6		10	2	14				
fe	56			1								
I	127				1							
Zn	65							1				
Cu	63					1						
Mn	55						1					
Fl	19								3	2		
Cl	35								1			
K	39				1							
	MW	100	172	206	166	249	169	287	92	1028		