PS:234-2016
ICS No:65.120

PAKISTAN STANDARD SPECIFICATION
FOR

# BALANCED FEED MIXTURE FOR LIVESTOCK
# (1ST REVISION)



**PAKISTAN STANDARDS AND QUALITY CONTROL AUTHORITY**
**Standards Development Centre,**
**PSQCA complex, Standardization Wing II, 1st Floor, Plot - ST-7/A, Block-3,**
**Scheme No.36, Gulistan-e-Jauher, Karachi**

# PAKISTAN STANDARDS & QUALITY CONTROL AUTHORITY
## (STANDARDS DEVELOPMENT CENTRE)

### (AGRICULTURE & FOOD DIVISION)

### MEMBERSHIP LIST OF ANIMAL FEEDS TECHNICAL COMMITTEE

**CHAIRMAN**

| | | |
|---|---|---|
| 1. | Mr. Zuzzer A. Shamsuddin,<br>Consultant, | Hamilton Court,<br>Clifton Road,<br>Karachi. |

**MEMBERS**

| | | |
|---|---|---|
| 2. | Chief, Nutrition Division | National Institute of Health<br>Islamabad |
| 3. | Govt. Public Analyst | Food Laboratory,<br>24 - Cooper Road,<br>Lahore |
| 4. | Govt. Public Analyst | Food Laboratory,<br>Quetta |
| 5. | Govt. Public Analyst | Food Laboratory<br>Directorate General Health Services<br>Sindh old building<br>Wahdat Colony<br>Hyderabad |
| 6. | Govt. Public Analyst, | Food Laboratory<br>Hayatabad,<br>Peshawar |
| 7. | Dr. Sarfaraz Ahmed, ,<br>Regulatory Affairs Manager, | Engro Foods Ltd.,<br>Lahore. |
| 8. | Director General | PCSIR, Laboratories Complex,<br>Off, University Road,<br>Karachi |
| 9. | Director General, | Agriculture Research Institute,<br>Tandojam, Sindh. |

| | | |
|---|---|---|
| 10. | Director General, | Agriculture Research Institute,<br>Sariab, Quetta. |
| 11. | Director General, | Agriculture Research Institute,<br>Ternab, Peshawar |
| 12. | Mrs. Kishwar Shabina,<br>Senior Public Analyst, | KMC Food Laboratory,<br>Jigarmuradabadi Road,<br>Karachi |
| 13. | Surgeon General, | AGS Br. (Med Dte). G. H. Q.,<br>Rawalpindi |
| 14. | Dr. Mohammad Sadiq<br>Executive | Sadiq Brothers Allied Plaza, Chandi Chief<br>Chock, Muree Road,<br>Rawalindi |
| 15. | Mr. Khalil A. Sattar<br>Chairman | Pak Poultry Association, K&NS<br>Poultry Farms, K&NS centre, 160<br>Banglore Town, Shahrah-e-Faisal,<br>Karachi. |
| 16. | Mr. Shehzad Sikandar,<br>Regulatory Affairs Manager | Nestle Milk Pak Ltd.,<br>308, upper mall,<br>Lahore |
| 17. | Senior Research Officer | Animal Nutrition Centre,<br>Rakh Dera Chahl,<br>Lahore |
| 18. | Director General (Research) | Livestock & Dairy Development<br>Punjab, Ghazi Road,<br>Lahore Cantt |
| 19. | Mr. Aftab Mansoor | Sindh Feeds, Plot No. 19, Sector 16<br>Korangi Industrial area<br>Karachi |
| 20. | Dr. M. Aazam<br>District Officer | Veterinary Services<br>City District Govt. Old KMC Building,<br>M.A. Jinnah Road<br>Karachi |

| | | |
|---|---|---|
| 21. | Director, | Poultry Production & Research<br>Sindh, Korangi Industrial Area,<br>Karachi |
| 22. | Director, | Poultry Development Centre,<br>Shamsabad, Muree Road,<br>Rawalpindi |
| 23. | Director, | Directorate of Animal Husbandry,<br>Sheep Development Officer,<br>Hyderabad |
| 24. | Central Secretary, | Pakistan Poultry Association,<br>219, Mashriq Centre, Block-14,<br>Sir Shah Suleman Road, Gulshan-e-Iqbal,<br>Karachi |
| 25. | Director,<br>(Animal Feeds) | Pakistan Agri. Research Council,<br>Islamabad |
| 26. | Dr. Faqir M. Sabir, | Hi-Tech. Feeds Ltd,<br>114, Main Shadman,<br>Lahore |
| 27. | Dr. Raja Abdul Qayyum,<br>Poultry/Nutritionist Dairy, | 65, DOHS-I, Malir Cantt,<br>Karachi |
| 28. | General Manager, | Karachi Feeds, L-21, Block-22,<br>Federal-B-Area,<br>Karachi |
| 29. | Chief Executive, | Ravi Feeds,<br>Taj Arcade, 73, Jail Road,<br>Lahore |
| 30. | Chief Executive, | S.B. Feeds, Allied commercial Plaza,<br>Muree Road,<br>Rawalpindi |
| 31. | Mr. Naeem Shahid,<br>Chief Executive, | Halaal Foundation,<br>Gulshan-e-Maymar,<br>Karachi |

**SECRETARIATE**:

| | | |
|---|---|---|
| 1. | Mr. Naseem-us-Sami<br>Deputy Director (Agri. & Food) &<br>Secretary to the Committee, | Standards Development Centre,<br>PSQCA,<br>KARACHI |
| 2. | Ms. Yasmin Khanam<br>Examiner (Agri. & Food) | Standards Development Centre,<br>PSQCA,<br>KARACHI |
| 3. | Engr. Lal Muhammad Rajar<br>Examiner (Agri & Food) | Standards Development Centre,<br>PSQCA,<br>KARACHI |

# PAKISTAN STANDARD SPECIFICATION FOR BALANCED FEED MIXTURE FOR LIVESTOCK (1ST REVISION)

## 0. FORWORD

0.1 Pakistan Standards & Quality Control Authority, Standards Development Centre, on 25-02-2016 after the draft finalized by the Animal Feeds Technical Committee had been approved by the National Standard for Agriculture & Food Products.

0.2 This standard specification was established in 1963. Now being revised, keeping in view the latest developments in the feed industries.

0.3 A concentrate feed mixture is intended to supplement basal ration in a manner as to meet the requirements of the Animal either for milk production, or for work and to the ensure a proper balance between protein and energy so that the nutrients in the feed ration are utilized properly without wastage.

0.4 A few feeds formulae, which have given satisfactory results have been included in this standard. However necessary modifications could be made in the feed formulae according to locality season and availability of the ingredients. Feed mixture for milk cattle and working bullocks only have been included in this standard.

0.5 Concentrate are not fed alone but are generally used as a supplement of the basis roughages and it is expected that these would normally meet the mineral requirements. If however, the ration is deficient in mineral it may be necessary to supplement it with a mineral mixture.

0.6 In the preparation of this standard the views of the consumers, manufactures, technologists, and testing authorities have been taken into consideration.

0.7 For the purpose and dimensions appearing in this standard have been expressed in rounded off value in metric units.

0.8 For the purpose of deciding whether a particular requirements 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 PS: 103 (Rev.) Method of Rounding off Numerical values, the number of significant places retained in the rounded off value shall be same as that specified value in the standard.

0.9 This standard is intended chiefly to cover the technical provision relating to the concentrate feed mixture for cattle and does not include all the necessary provision of a contract.

0.10 All the ingredients shall be free from porcine origin.

## 1. SCOPE

1.1 This standard prescribes the requirements and the Methods of Test for Concentrate Feed Mixtures for cattle (milch and working bullocks).

## 2. SAMPLING

2.1 Representative samples of the material for tests shall be drawn according to the procedure prescribed in Appendix "A" of PS: 233 for Poultry Feeds (Rev.)

## 3. INGREDIENTS

3.1 For compounding the concentrate feed mixtures, the following ingredients may be used.

Arhar or Turchuni:

i) Pigeonpea or Arhar is the entire seed of the pulse, *Cajamus indicus*. Tur is another variety or name of the same plant.

ii) Barley – It is the entire by-product resulting from the manufacturer of pearl barley from clean barley.

iii) Coconut oilcake – The residue resulting from the removal of oil from commercially pure coconut seed.

*iv)* Gram – Chickpea, Gram, Gram chickpea, Aerbazas or Chena is the entire seed of the pulse, *Cicer aritinum.*

v) Gram husk or bran – It is the coarse outer covering of the gram seed as separated from clean gram in the usual process of commercial milling.

vi) Groundnut oilcake - It is the product obtained after the extraction of part of the oil by pressure or solvents from the groundnut kernels as produced under reasonable milling conditions. It must be designated and sold according to its protein content.

vii) Guar (*Cyamopsis tetragonoloba*) and guar meal – Guar is the entire seed or bean of the leguminous crop, *cyamopsis psoralioides* and/or *C. tetragonaoloba*. Guar meal is the ground residue remaining after the extraction of the manogalactan gum which the guar bean contains. The minimum percentage of protein and the maximum percent of the crude fibre must be stated. Also. it must be stated if the guar meal is treated or untreated to remove the bitterness.

viii) Horse gram or Kulthi – It is the entire seed of the pluse, *dolichose biflorus*.

ix) Sorghum grain or Juar – It is the entire seed, whether whole or ground of Andropogon Sorghum or *Sorghum vulgare*.

x) Linseed oilcake – The residue resulting from the removal of oil from commercially pure linseed seed by several methods.

xi) Maize or maize meal is the finely ground, unbolted maize, or Pakistani corn grain.

xii) Maize bran – It is the outer coating of the maize kernel, with little or none of the starchy part or germ.

xii) Maize gluten – It is that part of the commercial shelled maize that remains after the extraction of large part of the starch, gluten or germ, by-processes employed in the wet milling manufacture of maize starch or syrup. It may or may not contain one or more of the following

Maize soluble, maize oil meal.

xiv) Mustard oilcake – The residue resulting from the removal of oil from the commercially mustard seed.

xv) Oats – The oats or oat meal is a product obtained in the manufacture of rolled oat groats or rolled oats and consists of broken rolled oat groats, with only such quantity of finely ground oat hulls as is unavoidable in the usual process of commercial milling.

xvi) Rice bran – It is the pericarp or bran layer, the byproduct produced in milling shelled rice, with such quantity of hull fragments as is unavoidable in the regular milling of rice.

xvii) Sesame oilcake – The residue resulting from the removal of oil from the commercially sesame seed.

xviii) Tapioca chips or flour – Cassava, Tapioca, Manihot or Manioe chips are produced from slicing the roots of *Manihot esculenta* or Mutilissima cooking and drying or as a by-product in the manufacture of starch from these roots. A meal or flour can be produced by grinding the chisps.

xix) Wheat bran – It is the coarse outer covering of the wheat kernel as separated from cleaned and scoured wheat in the usual process of commercial milling.

xx) Maize oilcake – It consists of the maize germ from which most of the oil has been removed.

xxi) Molasses feeds – Any mixture containing not less than 10 percent of sugar of an absorbent material and treacle or molasses.

xxii) Rapeseed oilcake – It consists of the residue after the removal of oil from commercial rape seed.

xxiii) Gram chuni – It is the hulls, bran and broken bits of the seed or it may mean the pod.

xxiv) Toria – (in any form):

Toreia seed is from winter or Indian rape.
(*Brassica napus* var. Dichotoma)

xxv) Beet pulp – Dried beet pulp is the dried residue from sugar beets which have been cleaned and free from crowns; leaves; and sand which have been extracted in the process of manufacturing sugar.

xxvi) Berseem meal – Berseem meal is the product as grown, obtained by grinding berseem or Egyptian clover (*Trifolium alexandrinum*) hay which is reasonably free of other crop plants, weeds and mold and to which no other matter has been added. It must not contain more than 33 percent of crude fiber.

xxvii) Moth – Moth bean is the entire seed of the pulse, *Phaseolus aconitifolius*.

xxviii) Matri – All can find out about this is that it is “a pea” presumably from the *Pisum sativum* or *P. arvense* species, but perhaps not. Peas are the seed of the legume Pisum sp.

xxix) Dried Janter – Jantar is the seed of the species, *Susbenia aegyptica*.

xxx) Khesari

## 4. REQUIREMENTS

4.1 Description – The material shall be free from harmful constituent. It shall be free from rancidity, adulterants, insect or fungal infestation and from fermented musty or other objectionable odour. It shall be free from dirt and extraneous matter including iron or other metallic pieces and it shall also be free pathogenic microorganism.

4.1.1 The material may be in from of meal or cubes or pellets subject to agreement between the purchaser and the vendor.

4.2 The material shall conform to the requirements prescribed in Table – I and Table-II.

**TABLE - I**
**REQUIREMENTS FOR CONCENTRATE FEED MIXTURES FOR CATTLE.**

| SL # | Characteristics | Requirement | | |
|---|---|---|---|---|
| | | Dairy Feed Type-I | Dairy Feed Type-II | Cattle Feed |
| 1. | Moisture, percent by weight, max. | 11.0 | 11.0 | 11.0 |
| 2. | Crude protein (nitrogen x 6.25) on moisture-free basis, percent by weight, min. | 22.0 | 20.0 | 12.0 |
| 3. | Crude fibre on moisture-free basis, percent by weight, max | 10.0 | 12.0 | 20.0 |
| 4. | Crude fat, percent by weight min. | 4.0 | 3.0 | 3.5 |
| 5. | Phosphorus, percent by weight, min. | 0.6 | 0.6 | 0.5 |
| 6. | Total Ash, max. | 10.0 | 11.0 | 15.0 |
| 7. | Acid Insoluble Ash, max. | 3.0 | 4.0 | 4.0 |
| 8. | Metabolic Energy/animal/24hrs Kilocalories, min | 2600 | 2500 | 2400 |
| 9. | Minerals (Salt, as NaCl), Target | 1.5 | 1.5 | 1.0 |
| 10. | Total Aflatoxin level (B1+B2+G1+G2), max. | 20 ppb | 20 ppb | 50 ppb |

**TABLE - II**
**MICROBIOLOGICAL LIMITS**

| Sl # | ORGANISM | RECOMMENDED VALUE |
|---|---|---|
| 1. | Total Coliform | 0/250 mL |
| 2 | *E. coli* | 0/250 mL |
| 3 | Salmonella | 0/250 mL |
| 4. | Total Plate count at 37°C | $1x10^4$/mL |

## 5. TESTS

5.1 The relevant testing methods of PS, ISO, CAC, AOAC and other internationally recognized standard methods may be taken into account for analysis purpose.

## 6. PACKING AND MARKING

6.1 Unless specified otherwise by the purchaser the material shall be packed in clean sound bags in accordance with PS: 1436 for B-Twill Jute bags or PS: 2958 for Polypropylene Sacks for packing fertilizer or PS: 1692 for Cotton bags. The mouth of each bag shall be machine stitched.

### 6.2 MARKING

Each bag shall be marked to give the following information:

(a) Name of the material in block letters;
(b) Name of the manufacturer;
(c) Batch or code number;
(d) Net weight in kg;
(e) Date of manufacture; and expiry
(f) Ingredients.
(g) This Pakistan Standard Number, Licence number and PS Mark.

## 7. METHOD OF SAMPLING EXAMINATION AND ANALYSIS

7.1 Method of Sampling Examination & Analysis shall be carried out in accordance with the methods prescribed in PS: 233 for Poultry Feeds.

## APPENDIX – A (Clause 0.3)
## RECOMMENDED FEED FORMULAE

A.1 The concentrate feed mixture may be compounded as follows by using the ingredients mentioned in clause 3, in proportions indicated against each.

| | |
|---|---|
| **I** | |
| Wheat bran | 50 |
| Mustard oilcake | 30 |
| Gram chuni | 20 |
| Total | 100 |
| **II** | |
| Gram chuni | 35 |
| Cottonseed oilcake (decorticated) | 20 |
| Groundnut oilcake | 15 |
| Gram husk | 15 |
| Wheat bran | 15 |
| Total | 100 |
| **III** | |
| Gram chuni | 35 |
| Cottonseed oilcake | 35 |
| Guar | 15 |
| Rice bran | 15 |
| Total | 100 |
| **IV** | |
| Gram chuni | 40 |
| Linseed oilcake | 35 |
| Wheat bran | 25 |
| Total | 100 |
| **V** | |
| Wheat bran | 40 |
| Sesamum oilcake | 20 |
| Gram chuni | 20 |
| Barley | 20 |
| Total | 100 |
| **VI** | |
| Gram | 40 |
| Oats | 30 |
| Groundnut oilcake | 20 |
| Wheat bran | 10 |
| Total | 100 |
| **VII** | |
| Maize | 40 |
| Gram | 35 |
| Groundnut oilcake | 20 |
| Gram husk | 5 |

| | |
|---|---|
| Total | 100 |
| **VIII** | |
| Horse gram | 40 |
| Sesamum oilcake | 20 |
| Jowar | 20 |
| Rice bran | 10 |
| Gram husk | 10 |
| Total | 100 |
| **IX** | |
| Gram chuni | 35 |
| Tapioca flour | 30 |
| Coconut oilcake | 20 |
| Groundnut oilcake | 15 |
| Total | 100 |
| **X** | |
| Tapioca flour | 25 |
| Horse gram | 25 |
| Groundnut oilcake | 25 |
| Wheat bran | 25 |
| Total | 100 |
| **XI** | |
| Maize gluten | 25 |
| Maize | 25 |
| Maize husk | 25 |
| Wheat bran | 25 |
| Total | 100 |
| **XII** | |
| Maize | 55 |
| Coconut oilcake | 25 |
| Wheat bran | 20 |
| Total | 100 |
| **XIII** | |
| Barley | 30 |
| Mustard oilcake | 25 |
| Cotton seed oilcake | 25 |
| Wheat bran | 20 |
| Total | 100 |
| **XIV** | |
| Barley | 50 |
| Mustard oilcake | 30 |
| Oats | 20 |
| Total | 100 |
| **XV** | |
| Gram | 40 |
| Maize | 40 |
| Groundnut oilcake | 15 |
| Gram husk | 5 |

| | |
|---|---|
| Total | 100 |
| **XVI** | |
| Gram | 40 |
| Barley | 40 |
| Sesamum oilcake | 15 |
| Rice bran | 5 |
| Total | 100 |
| **XVII** | |
| Maize | 30 |
| Gram | 30 |
| Cottonseed oilcake | 20 |
| Rice bran | 10 |
| Groundnut oilcake | 10 |
| Total | 100 |
| **XVIII** | |
| Gram chuni | 35 |
| Wheat bran | 30 |
| Gram husk | 15 |
| Guar meal | 10 |
| Groundnut oilcake | 10 |
| Total | 100 |
| **XIX** | |
| Mustard oilcake | 40 |
| Barley | 40 |
| Wheat bran | 20 |
| Total | 100 |
| **XX** | |
| Wheat bran | 30 |
| Barley | 30 |
| Groundnut oilcake | 20 |
| Gram | 20 |
| Total | 100 |
| **XXI** | |
| Maize | 40 |
| Wheat bran | 30 |
| Groundnut oilcake | 20 |
| Gram | 10 |
| Total | 100 |

==========