Layer Feed Formulation Guide for Nigerian Poultry Farmers

Complete Manual for Maximum Egg Production

Version 1.0 | September 2025
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1. Quick Reference: 50kg Layer Mash Formula

Complete Formula (Exactly 50.00 kg)

Ingredient	Amount (kg)	Purpose	Quality Check
Maize (Yellow/White)	28.05	Energy (ME ~3,300 kcal/kg)	Moisture <14%, no mold, bright color
Soybean Meal (45% CP)	7.50	Primary protein & lysine	Light tan, nutty smell, not burnt
Groundnut Cake (45% CP)	4.00	Local protein source	No bitter taste, test for aflatoxin
Wheat Offal/Bran	3.50	Fiber, B vitamins	Fresh smell, no weevils
Limestone (Fine + Coarse)	5.00	Calcium for shells	38% Ca, 60% coarse (2-4mm)
Dicalcium Phosphate	1.20	Available phosphorus	18% P minimum
Salt (NaCl)	0.25	Electrolyte balance	Iodized table salt
Layer Premix	0.25	Vitamins & trace minerals	Check expiry date
DL-Methionine	0.10	Egg size & feathering	99% purity

L-Lysine	0.10	Protein synthesis	98.5% purity
Mycotoxin Binder	0.05	Aflatoxin protection	Use proven brands
TOTAL	50.00		

Nutritional Specifications (Calculated)

Nutrient	Amount	Target Range	Function
Crude Protein	16.5%	16-17%	Egg production & body maintenance
Metabolizable Energy	2,750 kcal/kg	2,700-2,800	Energy for production
Calcium	4.3%	4.0-4.5%	Shell formation
Available Phosphorus	0.32%	0.30-0.35%	Bone & shell quality
Lysine (digestible)	0.75%	0.73-0.78%	Egg mass
Methionine (digestible)	0.38%	0.36-0.40%	Egg size
Sodium	0.15%	0.15-0.18%	Water balance

Alternative Ingredients (Substitutions)

If You Can't Find	Replace With	Adjustment Needed
Maize	Low-tannin sorghum	Same amount, add 0.5 kg oil if needed
Soybean Meal	More GNC + fish meal	Recalculate amino acids
Wheat Offal	Rice bran	Use 80% of amount
Limestone	Oyster shell	Same amount

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2. Scaling Guide for Different Flock Sizes

Batch Sizes for Common Flock Numbers

Flock Size	Daily Feed Need	Weekly Feed Need	Batch Size to Mix
100 birds	11 kg	77 kg	100 kg (lasts 9 days)
250 birds	27.5 kg	193 kg	200 kg (lasts 7 days)

500 birds	55 kg	385 kg	400 kg (lasts 7 days)
1,000 birds	110 kg	770 kg	800 kg (lasts 7 days)
2,500 birds	275 kg	1,925 kg	2 tons (lasts 7 days)
5,000 birds	550 kg	3,850 kg	4 tons (lasts 7 days)

Mixing Instructions by Scale

For 50-200 kg batches:

- Use a concrete mixer or manual mixing
- Mix micro-ingredients with 2 kg wheat offal first
- Add to main batch and mix 10 minutes

For 500+ kg batches:

- Use a vertical or horizontal mixer
- Pre-blend additives in 10 kg carrier
- Mix time: 5 minutes dry, 2 minutes if adding oil

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3. Daily Feeding Calculator

Feed Intake Guidelines

Production Stage	Age (Weeks)	Feed/Bird/Day	Protein Need	Calcium Need

Pre-lay	16-18	75-85g	15-16%	2.0-2.5%
Early lay	19-24	95-105g	17-18%	4.0-4.3%
Peak production	25-40	110-120g	16-17%	4.3-4.5%
Mid-lay	41-60	105-115g	16-16.5%	4.3-4.5%
Late lay	61+	100-110g	15.5-16%	4.5-5.0%

Quick Calculation Formula

Daily feed cost per bird = (Price of 50kg bag ÷ 50,000g) × 110g

Example Calculations:

- If 50kg bag = ₦45,000: Daily cost = ₦99/bird
- If 50kg bag = ₦50,000: Daily cost = ₦110/bird
- If 50kg bag = ₦55,000: Daily cost = ₦121/bird

Water Requirements

Temperature	Water:Feed Ratio	Water per 100 birds/day
Cool (20-25°C)	2:1	22-24 liters
Warm (26-30°C)	3:1	33-36 liters

Hot (31-35°C)	4:1	44-48 liters
Very Hot (>35°C)	5:1 or more	55-60+ liters

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4. Heat Stress Management Protocol

Feeding Schedule for Hot Weather

Time	Action	Amount	Reason
5:30-7:00 AM	Main feeding	40% of daily	Birds eat before heat
10:00 AM	Check water	Top up	Prevent dehydration
2:00 PM	Flush water lines	-	Provide cool water
4:00 PM	Add coarse limestone	2-3g/bird	For overnight shells
6:00-7:00 PM	Second feeding	40% of daily	Cooler temperature
12:00-1:00 AM	Optional midnight feeding	20% of daily	During heat waves

Heat Stress Nutrition Adjustments

Adjustment	Normal	Heat Stress	Why
Protein density	16-17%	17-18%	Compensate for lower intake
Energy source	Mainly starch	Add 1-2% oil	Less heat increment
Sodium	0.15%	0.18-0.20%	Replace losses
Vitamin C	Not required	200mg/kg	Stress protection
Electrolytes	Standard	Add to water	Hydration support

Environmental Management Checklist

- Orient houses East-West
- Paint roof white or use reflective material
- Install roof sprinklers for >35°C days
- Ensure 1 fan per 150 birds
- Provide 1 nipple per 8-10 birds
- Check nipple flow rate (>70ml/min)
- Add curtain management for cross-ventilation
- Consider foggers for extreme heat

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5. Ingredient Quality Checklist

Visual Inspection Guide

Ingredient	Good Quality	Reject If
Maize	Bright yellow/white, hard, dry	Dark spots, musty smell, >14% moisture
Soybean Meal	Light tan, uniform, nutty smell	Dark brown, burnt smell, lumps
Groundnut Cake	Light brown, fresh smell	Bitter taste, mold, rancid smell
Wheat Offal	Light brown, fluffy	Sour smell, weevils, lumps
Limestone	White/grey powder + granules	Excessive dust, wrong particle size
Fish Meal	Light brown, fishy smell	Dark/black, ammonia smell

Storage Guidelines

Item	Storage Method	Maximum Duration
Mixed feed	Dry, ventilated area	14 days
Maize	Moisture <14%, raised floor	3 months
Protein meals	Cool, dry, sealed bags	1 month

Premix	Cool, dark place	Check expiry
Limestone	Dry area, covered	6 months

Aflatoxin Prevention Protocol

1. Source Control:
    - Buy from certified suppliers
    - Request aflatoxin test certificates
    - Reject maize/GNC with visible mold
2. Storage Management:
    - Keep moisture below 14%
    - Ensure good ventilation
    - Use within recommended time
3. Feed Protection:
    - Always add mycotoxin binder
    - Mix fresh batches weekly
    - Clean feeders daily

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6. Troubleshooting Common Problems

Egg Production Issues

Problem	Possible Cause	Solution
Sudden drop in production	Disease, stress, feed change	Check birds, maintain consistency
Gradual decline	Aging, poor nutrition	Review feed formula, cull old birds

Never reached peak	Poor pullet rearing	Improve growing phase nutrition
Irregular laying	Light program issues	Fix to 16 hours daily

Egg Quality Problems

Problem	Likely Cause	Corrective Action
Thin shells	Low calcium, old birds	Increase limestone, add Vit D3
Soft shells	Calcium/phosphorus imbalance	Check Ca:P ratio (12:1)
Small eggs	Low protein, young birds	Increase methionine
Pale yolks	Low pigments	Add yellow maize, marigold
Blood spots	Vitamin K deficiency	Check premix inclusion
Watery whites	Disease, old eggs	Vaccination, collect eggs often

Feed-Related Issues

Observation	Meaning	Response

Feed refusal	Rancid, moldy, or sudden change	Check quality, transition slowly
Selective eating	Poor mixing, particle size issues	Improve mixing, use uniform grind
High feed wastage	Feeder height wrong	Adjust to back level
Wet litter	High salt, poor quality protein	Check salt, reduce wheat offal

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7. Monthly Record Sheet Template

Daily Production Record

Date	Birds	Eggs	% Prod	Feed (kg)	Water (L)	Mortality	Notes
1							
2							
3							
...							

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TOTAL

AVERAGE

Key Performance Indicators (KPIs)

- Hen-Day Production: (Eggs ÷ Hens alive) × 100
- Feed Conversion Ratio: Feed consumed ÷ Egg mass
- Mortality Rate: (Dead birds ÷ Starting number) × 100
- Feed Cost per Egg: Total feed cost ÷ Total eggs
- Water:Feed Ratio: Water consumed ÷ Feed consumed

Monthly Cost Analysis

Item	Quantity	Unit Price	Total Cost
Feed			
Water			
Medication			
Labor			
Total Expenses			

Egg Sales
Profit/Loss

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8. Nigerian Supplier Contact List

Feed Ingredient Suppliers

Region	Supplier Type	Where to Find	What to Check
Lagos	Feed mills	Agege, Ikorodu	Price, quality certificates
Ogun	Maize dealers	Lafenwa, Idi-Aba	Moisture content, color
Kano	Groundnut cake	Dawanau market	Aflatoxin test
Kaduna	Soybean meal	Station market	Processing quality
Abuja	Premix suppliers	Dei-Dei market	Expiry dates

Online Suppliers (Verified)

- Afrimash.com - Wide range, delivery available
- Livestocking.com - Bulk ingredients

- Vet Planet - Premixes and additives

Quality Testing Laboratories

Service	Location	Tests Available
NAFDAC Labs	Multiple states	Aflatoxin, proximate analysis
University Labs	ABU, UI, FUNAAB	Complete feed analysis
Private Labs	Lagos, Ibadan	Quick moisture, protein tests

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9. References and Further Reading

Technical Standards

- NRC (1994) Nutrient Requirements of Poultry
- Nigerian Institute of Animal Science (NIAS) Feed Standards
- FAO Guidelines for Tropical Poultry Production
- Hy-Line Management Guide (Current Edition)
- Lohmann Brown Management Guide

Regulatory Requirements

- NIAS Feed Mill Registration (2017 Regulation)
- NAFDAC Feed Safety Guidelines
- Federal Ministry of Agriculture Standards

Useful Contacts

- NIAS: info@nias.gov.ng
- Poultry Association of Nigeria: www.pangrolls.com
- FAO Nigeria: FAO-NG@fao.org

Additional Resources

- Monthly commodity prices: www.fmard.gov.ng
- Weather/heat forecasts: www.nimet.gov.ng
- Disease updates: www.ncdc.gov.ng

Quick Reference Card (Cut Out and Laminate)

Daily Checklist

- Feed at 6 AM and 6 PM
- Check water flow all nipples
- Collect eggs 3 times
- Record feed consumption
- Note any sick birds
- Clean feeders if needed
- Adjust house ventilation
- Record maximum temperature

Emergency Contacts

- Veterinarian: _____
- Feed supplier: _____
- Egg buyer: _____
- Extension officer: _____

Disclaimer

This guide provides general recommendations based on established poultry nutrition principles and Nigerian conditions. Actual requirements may vary based on bird genetics, local ingredients, and

farm conditions. Always consult with a qualified animal nutritionist or veterinarian for specific advice. Feed formulations should be tested and adjusted based on actual bird performance.

Update Log

Version	Date	Changes
1.0	Sept 28, 2025	Initial release
		Formula validated for 50.00kg
		Added heat stress protocols
		Updated Nigerian prices

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For the latest updates and to download the newest version, visit:
https://chickenstarter.com/how-to-formulate-layer-mash-in-nigeria/

Notes Section (For Your Records)

Use this space to record your own observations, local supplier contacts, and formula modifications

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Thank you for choosing sustainable poultry farming!

Together, we can achieve food security in Nigeria through proper nutrition and management.