Feeding broiler chicken

Classification of poultry feeds:

1. Roughage- only succulent or leafy vegetable
2. Concentrate: Plant and animal origin feeds
3. Mineral supplement: plant and animal origin and synthetic source
4. Vitamin supplement: Plant and animal source and synthetic
5. Feed Additives: No-nutritive materials

Feed is a major component of the total cost of broiler production, which is about 65-70% of the total production cost. To support optimum performance, formulate broiler rations to give the correct balance of energy, protein, minerals, vitamins and essential fatty acids. The choice of feeding program will depend on the target of the business.

Supply of Nutrients

Energy

Broilers require energy for growth, body maintenance and other physical activities. Carbohydrate sources, such as corn and wheat, and various fats or oils are the major source of energy in poultry feeds. Energy levels in diets are expressed in Mega joules (MJ/kg) or kilocalories (kcal/kg) of Metabolizable Energy (ME), as this represents the energy available to the broiler. Energy comes from CHO, Fat and Protein.

Energy requirement for Broiler

	ME Kcal/kg
Broiler starter ration	3000
Broiler Grower ration	3100
Broiler Finisher ration	3200

Carbohydrate feeds

Carbohydrate: Grains and their byproducts-
Grain: Corn, Wheat, Oats, Bajra, Jowar, Barley, Rice, Oil seeds etc

Byproducts- Rice bran, Rice polish, Wheat bran, molasses etc

Fat rich feeds

Fats and oils: Any oil seeds, Soya bean oil, Palm oil, fats from feeds, etc

Protein rich feeds

Feed proteins present in plant (pulse seeds, oil seeds, cereals and their byproducts, yeast etc) and animal origins (meat meal, fish meal, blood meal, surplus milk, termites (Insects) etc. are broken down by digestion into amino acids. These amino acids are absorbed and assembled into body proteins that are used in the construction of body tissue, e.g. muscles, nerves, skin and feathers.

Source

Plant origin: Pulse seeds, oil cake, soybean meal, cereals and their byproducts, etc

Animal origins: Meat meal, meat offal, feather meal, bone & meat meal, fish meal, blood meal, surplus milk, termites, yeast etc

Protein requirement for Broiler

	CP%
Broiler starter ration	22
Broiler Grower ration	21
Broiler Finisher ration	19

Minerals

There are about 40 inorganic elements found to exist in different parts of the animal body. Out of these, 14 major elements have been found to have specific function in animal body and the metabolic roles of the rest is not fully established. The minerals are classified into two major groups.

1. Macro Minerals

The provision of the correct levels of the major minerals in the appropriate balance is important for high-performing broilers. Minerals are needed for all metabolic functions. Appropriate minerals supplementation depends on the feed ingredients used, the feed manufacturer and local circumstances. The macro minerals involved are calcium, phosphorus, sodium, potassium, magnesium, chlorine and sulpher.

Source

Oyster shell, egg shell, bone meal, common salt, limestone, dicalcium phosphate, magnesium oxide, magnesium sulphate, vitamin-mineral premix etc

2. Micro or Trace Minerals

The micro minerals are also important for high level performance of broilers. The required micro minerals are manganese, iron, copper, iodine, zinc, cobalt, selenium.

Source

manganese salt- manganese sulphate, manganese chloride, manganese carbonate; copper salt- copper sulphate, copper carbonate, copper oxide; Iodized salt; zinc carbonate, zinc sulphate, sodium selenate, vitamin-mineral premix etc

Vitamins

Trace vitamins are needed trace amount for all metabolic functions. Appropriate vitamin supplementation depends on the feed ingredients used, the feed manufacturer and local circumstances. The vitamins are classified into two major groups.

1. Fat soluble vitamins: Vit-A, D, E and K
2. Water soluble vitamins: Vitamin-C and Vitamin-B complex

Vitamin-B complex: 9 Members are Thiamine (B_1), Riboflavin (B_2), Nicotinic acid (B_3), Pantothenic acid (B_5), Pyridoxine (B_6), Biotin (B_7), Folic acid (B_9), Cynocobalamine (B_{12}) and Choline

Source

Natural feeds, leafy vegetables, grass, yeast, vitamin-mineral premix etc.

Alternative to Antibiotic Growth Promoters (AGPs)

It is a common practice to use antibiotic in normal health condition to prevent pathogenic microorganisms. This is unethical and produced meat and eggs are not safe for human consumption. To avoid this problem following substance can be used.

Enzymes

Enzymes are now being routinely used in poultry feeds to improve digestibility and utilization of feed ingredients. In general, feed enzymes that act on carbohydrates, proteins and plant-bound minerals are available.

Two major categories enzymes are used in poultry diets.

1. Phytase enzyme (To make phytate phosphorus available)
2. Cellulolytic enzyme (To degrade Non-Starch Polysaccharides-NSP like pectin, cellulose etc)

Organic acids

Organic acids lower gut pH and prevent the growth of undesirable bacteria and may act directly against bacteria. Besides, antimicrobial effects are reported in the immune system.

The acids are Formic acid, propionic acid, butyric acid and fumaric acid are commonly used.

Prebiotics

Are non-digestible substances, mainly oligo and polysaccharides, lowering pH in the gut and by this inhibiting colonization of pathogenic microorganisms, stimulating immunity and neutralizing toxins.

Probiotics

Consist of single or a combination of bacteria, (mainly lactic acid producing) or yeasts. Bacteria and yeasts may be included as spores or as living microorganisms.

Feeding Schedule

Starter Feeds

The objective of the brooding period (0–10 days of age) is to establish good appetite and maximum early growth in order to meet 7-day body-weight objective. It is recommended that a Broiler Starter feed (3000 ME Kcal/Kg and CP 22%) be fed for 10 days. The recommended nutrient density will ensure optimal growth is established during this critical period of life. Crumble or mash feed may be used, but crumble is better.

Grower Feeds

Broiler Grower feed (3100 ME Kcal/Kg and CP 21%) is generally fed from 11 to 24 days of age. Starter to Grower transition will involve a change of texture from crumbs to mini-pellet. Depending on the pellet size produced, it may be necessary to feed the first delivery of Grower as crumbs or mini-pellets.

During this time broiler growth continues to be dynamic. It therefore needs to be supported by adequate nutrient intake. For optimum feed intake, growth and FCR, provision of the correct diet nutrient density (especially energy and amino acids) is critical.

Finisher Feeds

Broiler Finisher feed (3200 ME Kcal/Kg and CP 19%) account for the major volume and cost of feeding a broiler. It is therefore important that feeds are designed to maximize financial return for the type of products being produced.

Finisher feeds should be given from 25 days until processing as pellet form. Birds slaughtered later than 42 days of age should be given a second Finisher feed specification from 42 days onward.

Phase Feeding

This is practice for desirable growth and carcass lipid. However, bird nutrient needs do not change abruptly on specific days, but rather they change continuously over time. Most companies feed multiple feeds in an attempt to match bird nutrient requirements. Dietary nutrient concentrations are based on the objectives of the producers and market demand. There are three main objectives of feeding broilers and most producers use a combination of these.

Diet Type 1:
Nutrient-rich: energy and protein to optimize live weight gain and feed conversion. This approach may promote additional carcass lipid content.

Diet Type 2:
Lowered energy content but optimal crude protein and amino acid content. This approach will result in less lipid gain but maximize lean mass production. Live weight and feed conversion will be negatively affected.

Diet Type 3:
Low nutrient concentration both energy and protein. This approach will result in lower live weight growth with less lipid and higher feed conversion.

Supplemental Whole Wheat Feeding

The feeding of supplemental whole wheat to broiler chickens is being practiced in many countries around the world. Benefits observed include a reduction in feed cost and therefore cost per kg (lb) of live weight, improvements in gizzard development resulting in improved digestive efficiency.

Supplemental wheat may be added either at the feed mill or at the farm. This requires an on farm feed proportioning system. At the feed mill, whole wheat may be added in the mixer

Typically beginning around day 7, or when birds weigh 160 g, supplemental whole wheat is added at a level of 1%-5%. This can be gradually increased up to approximately 30%. The maximum percent used will depend on ration quality, wheat quality, desired performance and the performance of the individual flock.

Regular monitoring of bird live weight is important to determine the effect whole wheat addition has on a particular flock. The supplemental whole wheat should be removed 48 hours before slaughter to avoid contamination of the carcass during evisceration.

Performance Standards – Ross Broiler

Age in Days	Cumulative Body Weight	Cumulative Feed Consumption	Cumulative FCR
7	150	160	1.07
14	400	500	1.25
21	700	960	1.37
28	1100	1650	1.50
35	1500	2535	1.69
42	1900	3325	1.75

Performance Standards – Cobb 500 at SAU Farm

Age in Days	Cumulative Body Weight	Feed Consumption/ week	Cumulative Feed Consumption	Cumulative FCR
7	153	180	180	1.17
14	526	500	680	1.29
21	986	700	1380	1.39
28	1491	900	2280	1.52
35	2056	1100	3380	1.64
42	2486	1150	4530	1.82

Medication and vaccine withdrawal

During this period, special attention should be directed towards medication and vaccine withdrawal dates to ensure there is no residue retained in the carcass at processing. Carefully kept records are essential in this determination. Antibiotic withdrawal period should be five days before slaughtering.