

Impact of heat stress in broiler chicken

- ▶ Feed and nutrient intake declines.
- ▶ Feed intake reduced by 1.2 % for every 1°C rise in the temperature range of 22-32°C and 5 % for 1°C rise in the temperature range of 32-38°C.
- ▶ Water consumption increases -
From 1:2 to 1 : 4
- ▶ Heat dissipation and panting
- ▶ Growth and FCR affected. Chronic heat exposure adversely affects the meat quality particularly meat : bone ratio.
- ▶ Mortality – 5 – 10 %



Heat stress management

- ▶ Increase the levels of lysine, methionine, threonine , vitamins and minerals – 10 – 20 %
- ▶ Add electrolytes – potassium chloride / ammonium chloride / sodium bicarbonate – 500 – 2000 gram per ton of feed
- ▶ Supplement with amla / vitamin C, vitamin E and selenium.
- ▶ Increase feed / watering space and reduce stock density
- ▶ Add vegetable oils – 0.5 to 2.0 % so as to reduce heat increment.
- ▶ Avoid feeding during peak hours - Between 12 noon – 5.00 pm
- ▶ Cool / chilled water – Promote water intake
- ▶ Continuous flow of water in pipelines during day time
- Control the temperature of drinking water
- ▶ Pellet feed / crumble feed better than mash feed



PRODUCT DISPLAY



Winter management

- ▶ Feed intake regulated by energy density, calcium and aa content.
- ▶ Winter - feed intake increases – supply of other nutrients - more
- ▶ Increase the energy density by 100 – 200 kcal per kg
- ▶ Excess energy leads to fat deposition – Fatty liver – more mortality during summer
- ▶ Early cold conditioning to chicks,
- ▶ supplementing vitamin E 250 mg per kg of feed and
- ▶ Chromium 0.2 g per kg of feed can help reduce cold stress

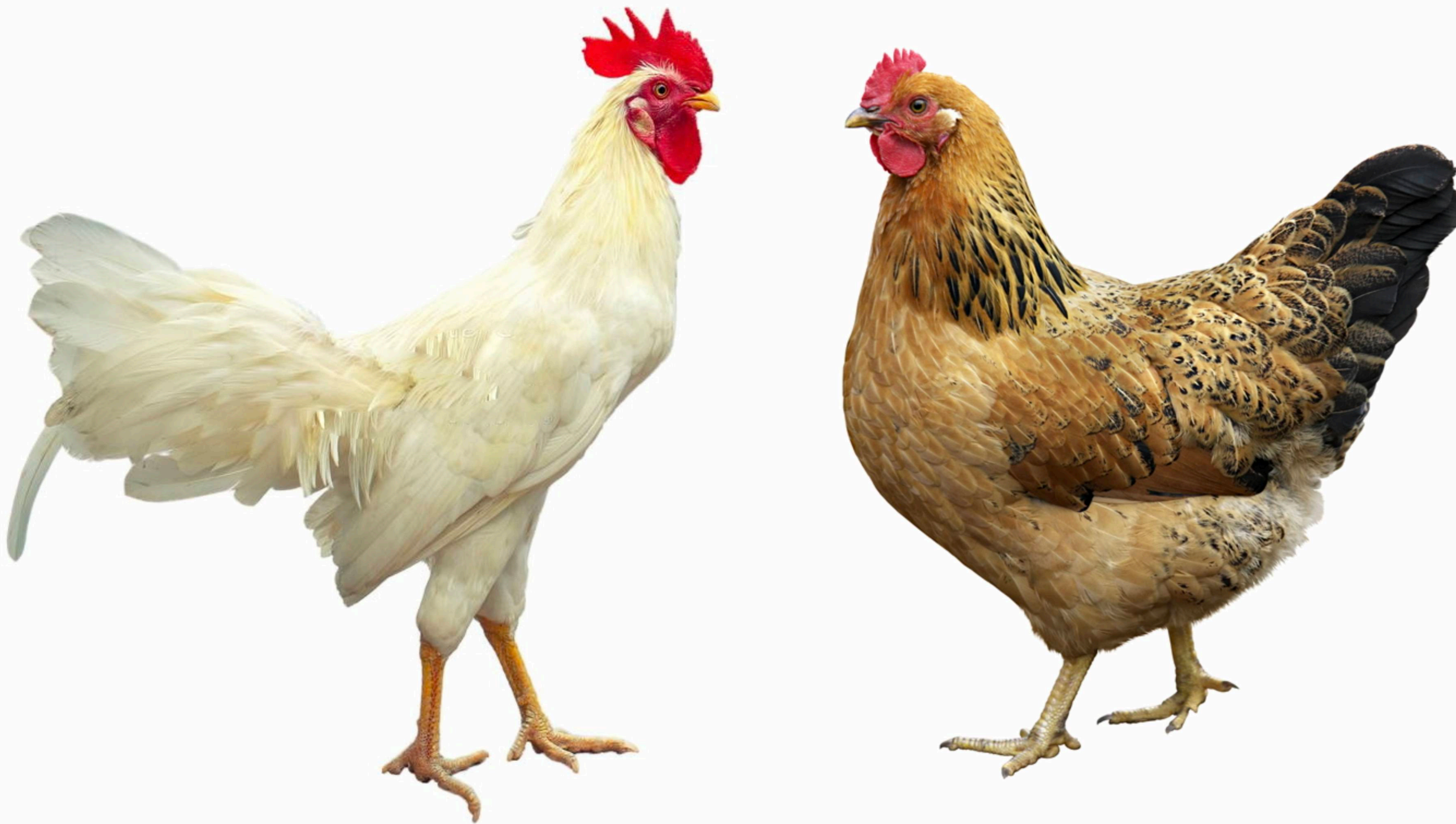


Factor Influencing Feed Efficiency

- ▶ **Dietary energy level** - As the energy level of the diet is reduced, birds eat more feed
- ▶ **Male vs female**
- ▶ **Phase feeding** - Best weekly once
- ▶ **Age and body weight at slaughter**
- ▶ **Feed processing** - using feeds with a CV of up to 7.5% is recommended.
- ▶ **Feeding frequency** – Boost feed consumption
- ▶ **Water intake** - to be promoted during heat stress
- ▶ **Health status of birds** – coccidiosis / parasites



Feeding Management of Commercial Layers



Requirement of Layer Feeds As Per BIS (2007)

| Characteristics (%) | Chick feed (0-8 wks) | Growing chicken feed (9-20 wks) | Layer Phase I (21-50 wks) | layer Phase II (51-72 wks) |
|-----------------------|-------------------------|---------------------------------------|---------------------------------|----------------------------------|
| Moisture, Max. | 11 | 11 | 11 | 11 |
| Crude protein, Min. | 20 | 16 | 18 | 16 |
| Ether extract, Min | 2.0 | 2.0 | 2.0 | 2.0 |
| Crude fibre, Max. | 7 | 9 | 9 | 10 |
| Acid insol. Ash, Max. | 4 | 4 | 4 | 4.5 |
| Salt (as NaCl), Max. | 0.5 | 0.5 | 0.5 | 0.5 |



| Characteristics (%) | Chick feed | Growing chicken feed | Layer Phase I | layer Phase II |
|--------------------------|------------|----------------------|---------------|----------------|
| Ca, Max. | 1 | 1 | 3 | 3.5 |
| Total P, Min. | 0.7 | 0.65 | 0.65 | 0.65 |
| Available P,Min. | 0.45 | 0.4 | 0.4 | 0.4 |
| Lysine, Min. | 1.0 | 0.7 | 0.7 | 0.65 |
| Methionine, Min. | 0.4 | 0.35 | 0.35 | 0.3 |
| M+C , Min. | 0.7 | 0.6 | 0.6 | 0.55 |
| M.E. (Kcal/kg), Min | 2800 | 2500 | 2600 | 2400 |
| Aflatoxin B1 (ppb) , Max | 20 | 20 | 20 | 20 |



Model ration for egg type chicken

| S. No | Raw material | Chick | Grower | Layer |
|-------|--|-------|--------|-------|
| 1 | Maize | 400 | 420 | 420 |
| 2 | Broken rice / Sorghum / Bajra | 100 | 100 | 132 |
| 3 | De-oiled rice bran | 191 | 220 | 80 |
| 4 | Sunflower oil cake (Pellet) CP – 35 % | 70 | 80 | 100 |
| 5 | Rape seed / cotton seed / DDGS / coconut / Til / gingelly oil cake | 0 | 20 | 20 |
| 6 | Soyabean meal / Fish meal (not exceeding 10 %) | 200 | 120 | 130 |
| 7 | Di-calcium phosphate | 15 | 20 | 18 |
| 8 | Calcite / Lime stone powder | 17 | 17 | 30 |
| 9 | Shell grit / oyster shell / stone grit | 0 | 0 | 60 |

| S. No | Raw material | Chick | Grower | Layer |
|-------|------------------------|-------|--------|-------|
| 10 | DL Methionine | 1 | 1 | 1 |
| 11 | L Lysine | 0.5 | 0.5 | 0 |
| 12 | Salt (Sodium chloride) | 3 | 3 | 3 |
| 13 | Trace mineral mixture | 1 | 1 | 1.5 |
| 14 | Toxin binder | 1 | 1 | 1 |
| 15 | Vitamin premix | 0.5 | 0.5 | 0.75 |

Layer Feeding

| | CHICK FEED (UP TO 7 WEEK) | GROWER FEED(8-11 WEEKS) | DEVELOPER FEED(12-14 WEEKS) | PRY-LAY FEED(15-20 WEEKS) |
|------------------------------------|---------------------------|-------------------------|-----------------------------|---------------------------|
| WEIGHT GAIN (GRAM) | 490 | 830 | 1040 | 1220 |
| TOTAL CONSUMPTION OF FEED (in Kg) | 1.3 | 1.4 | 1.2 | 1.7 |

NOTE-Growth Rate Better With Pellet/Crumble Than Mash Feed In Chick Feed (Up To 7 Weeks Of Age)

Phase Feeding

- ▶ Reduction In protein and Amino Acid Level of the Diet as Bird Progress Through a Laying Cycle
- ▶ According To age and Level of Production

| NUTRIENT | PHASE-I | PHASE-II | PHASE-III |
|----------------------|-------------|-------------|-------------|
| ME KCAL/KG | 2500 | 2450 | 2450 |
| CP | 17.5 | 16 | 15.5 |
| METHIONINE | 0.40 | 0.30 | 0.30 |
| LYSINE | 0.80 | 0.70 | 0.70 |
| CALCIUM | 3.6 | 4.0 | 4.5 |
| AVAILABLE PHOSPHORUS | 0.35 | 0.30 | 0.30 |

Two Reasons To Decrease CP And Methionine

- ▶ To Reduce Feed Cost
- ▶ To Reduce Egg Size

Note- Both CP And Methionine Increases Egg Size



Feed intake & Liveability

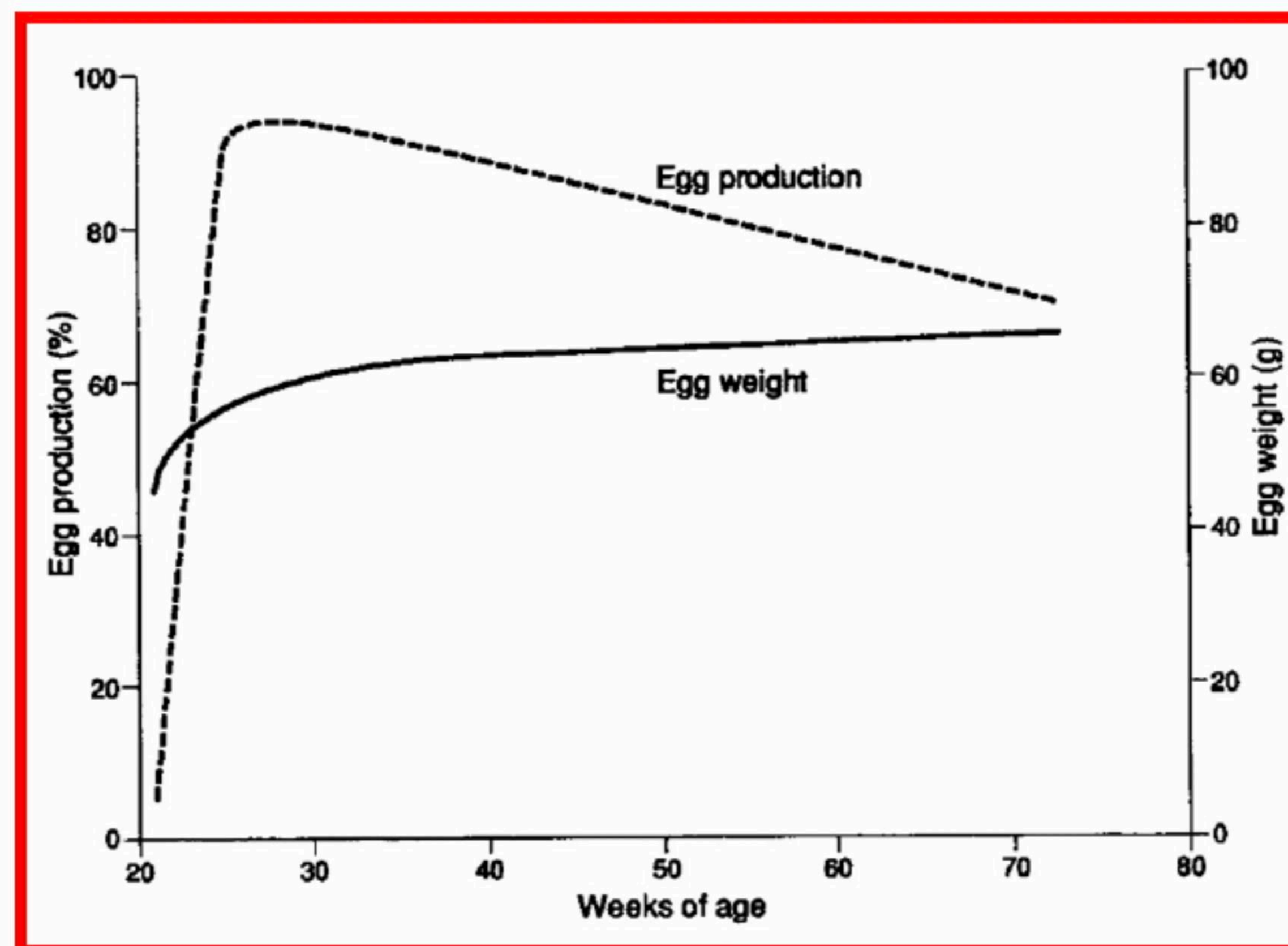
| | FEED INTAKE (KG) | LIVEABILITY(%) |
|-----------------------|------------------|----------------|
| 0 TO 18 WEEKS OF AGE | 5.6 | 96-97 |
| 19 TO 72 WEEKS OF AGE | 41 | 94-96 |

Body Weight

| | |
|--------------------|---------|
| AT 18 WEEKS OF AGE | 1.22 kg |
| AT 31 WEEKS OF AGE | 1.50 kg |
| AT 72 WEEKS OF AGE | 1.60 kg |

Egg Production

- ▶ Egg Production starts - 19 – 21 weeks of age
- ▶ Peak Production: 32-35 weeks of age
- ▶ Production gradually declines after 40 weeks of age @ 0.5 % per week
- ▶ Replacement – 72 – 80 weeks of age
- ▶ Sometimes up to 90 – 100 weeks of age



Egg Weight / Size

Genetic factors

Nutritional factors

Managemental factors

- ▶ **Energy and feed intake** - Overfeeding energy above recommended amounts tends to depress egg weights, as a consequence of lower feed intake.
- ▶ **Protein and specific amino acids** - sulfur-containing amino acids (TSAA), such as methionine and cysteine.
- ▶ **Linoleic acid and fat level** - soybean oil or flaxseed.
- ▶ **Feeding Programme** - Phase feeding is the best method of meeting these changing nutrient requirements.
- ▶ **Body weight** - should be more than 1.4 kg
- ▶ **Heat stress** can depress egg weight.

| | |
|--------------------|-------|
| AT 32 WEEKS OF AGE | 52 gm |
| AT 52 WEEKS OF AGE | 58 gm |
| AT 72 WEEKS OF AGE | 60 gm |

Egg Quality / Breakage

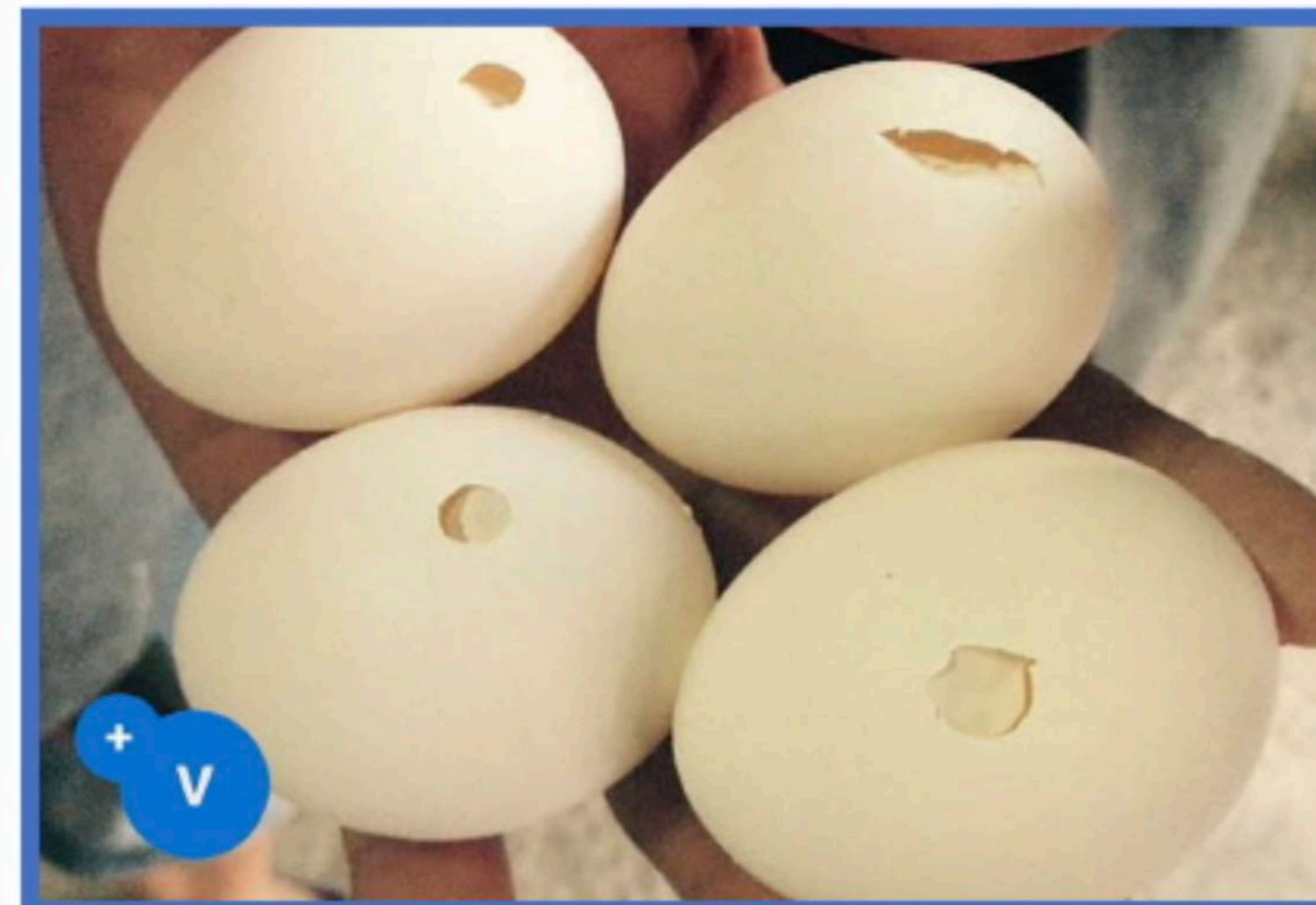
Genetic factors

Nutritional factors

Managemental factors

- ▶ **Age of Bird:** As the hen ages - shell thickness declines. Older flocks - larger eggs - break easily. The hen is genetically capable of placing only a finite amount of calcium in the shell.
- ▶ **Heat stress** – respiratory alkalosis – Sodium bicarbonate Ability of layers to convert vitamin D3 to its active form is reduced during heat stress.
- ▶ **Proper Ca / P / Vitamin D ratio**
Only 50 - 60% of dietary calcium - shell formation..
- ▶ **Source and form of calcium : Oyster shell / stone grit / Shell grit**

| | |
|--------------------|---------|
| AT 32 WEEKS OF AGE | 2 – 3 % |
| AT 52 WEEKS OF AGE | 3 -4 % |
| AT 72 WEEKS OF AGE | 4 – 6 % |



Calcium for egg production

Stone grit
Mg – Wet droppings



Oyster shell / shell grit
Slow release of Ca

Egg shell powder





Feeding management of commercial broiler chicken





Thank you