Welcome

Paschim Banga

POULTRY MELA

Technical Seminar

16th February, 2018

LAYER NUTRITION

Field Challenges & Solution

Venkys India Limited

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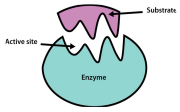
M. V. Sc. Poultry Science
Gold Medal

Present Scenario - Major challenges

	Uniformity
	Egg breakage / Shell quality
	Egg Size
	Poor Premixing
	Enzymes
	Bio - Security

Present Scenario - Nutritional Challenges

High protein low energy diets

Excess of calcium

Imbalance of Dig. Lysine, Methionine & their Ratios.

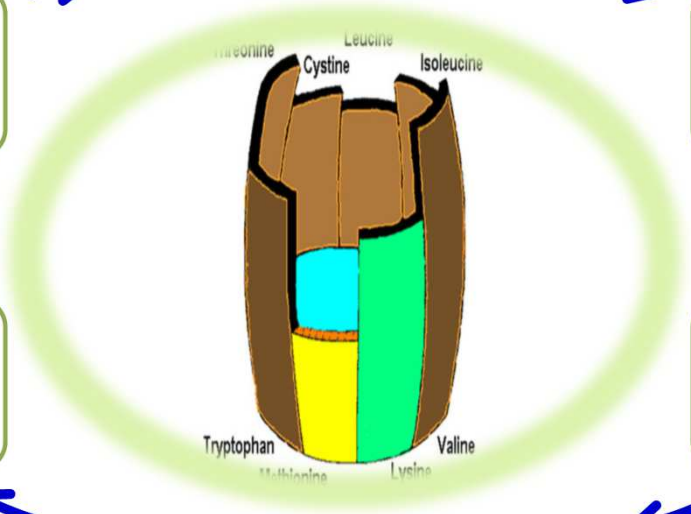
Unawareness about exact feed consumption per bird (Silos)

Use of Enzymes

(Need to consider matrix values)

Improper Weighing,

Mixing of feed ingredients



Introduction

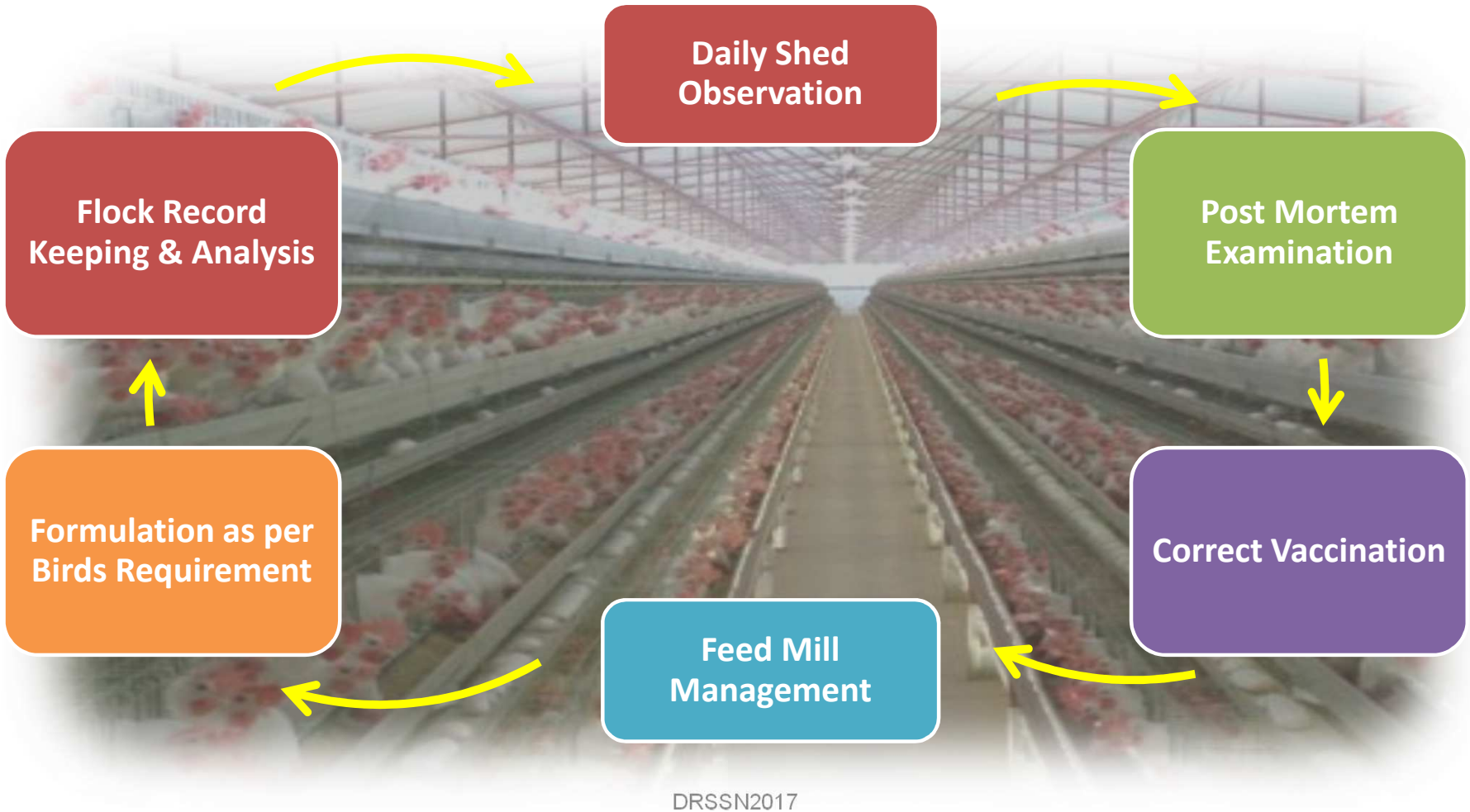
PREREQUISITES

For Getting 330+ Eggs (72 Weeks)

1. Brooding & Growing
2. Uniformity
3. Body Weight Development
4. Feeding
5. Vaccination
6. Bio-Security
7. Management

Respect the Basics to be Successful

Important aspects of the Layer Farm



Brooding & Growing

Brooding & Growing Shed – Cleaning & Disinfection

Maintenance of good Bio-Security & Hygiene at all Times

Optimum brooding environment

Success in the Laying shed is dependant upon the success in the Brooding & Growing

Important Nutritional Goals in Feeding the Laying Hens

Organ Development – 5 to 6 weeks

Body Frame achieved - 12 to 14 weeks

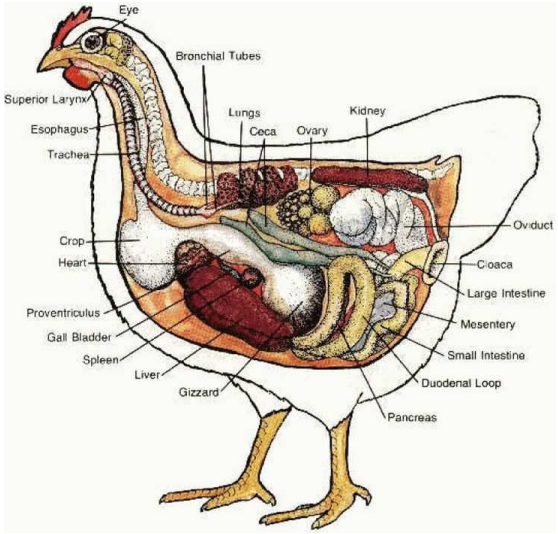
Sexual Maturity – correct Body Weight & Body Composition

Layers must be in positive energy balance at peak production.

Energy reserve occurs during growing period

F L O C K U N I F O R M I T Y

Maintain steady state throughout egg production



Nutrition – what is important??

In India (hot & tropical climate),

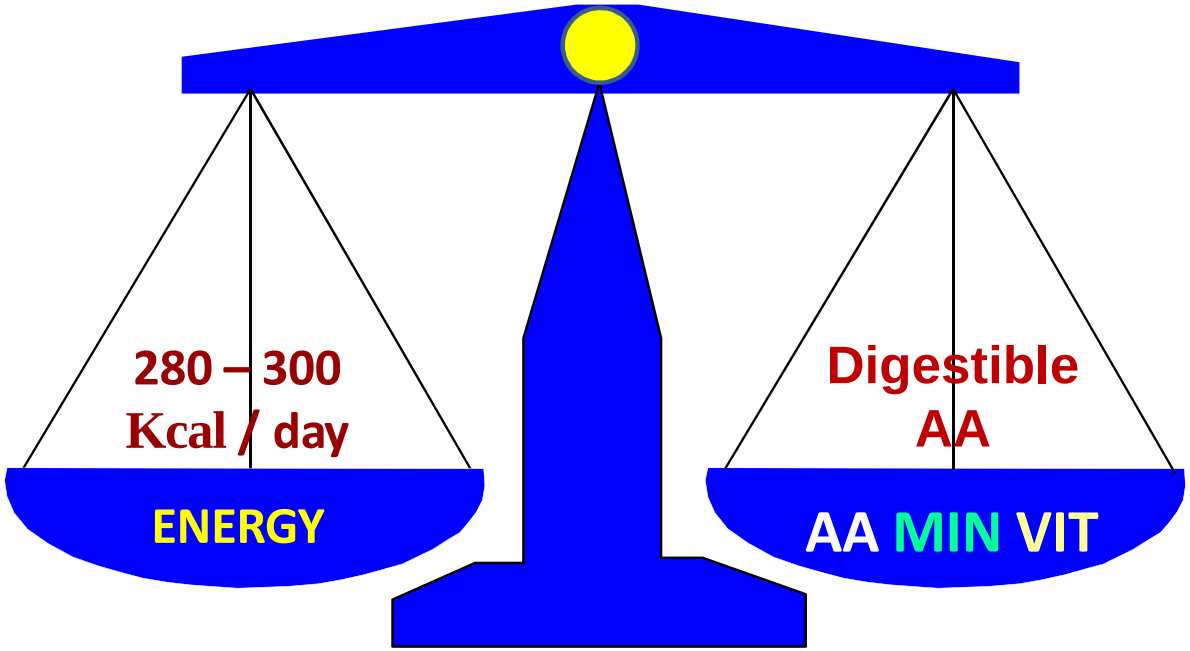
- poor production,
- small egg size, and
- thin shells.

inadequate daily intake of the required nutrients

In hot & humid climates - the energy requirement is low

Layer Bird eats to meet only her energy requirements.

Nutrition – Energy Balance



Laying hens eat to satisfy their energy needs and they do it with great precision within certain dietary energy limits.

Nutrition – Phase - I

- **High Energy** — **2650 Kcal**
  - Egg Production
  - Body Weight
- **High Calcium & Phosphorus** — **Ca – 3.80% Ap – 0.44%**
  - Bone Structure
  - Egg Shell Quality
  - Critical for Peak & Persistency of Egg Lay
- **High Amino Acids** — **Dig. Ly – 0.72**, **Dig. M+C – 0.62**
  - Egg Weight
  - Body Weight
- **Vitamin & TM Premix**
  - Increase Vitamin & TM by 20% until feed is 100 gm

Nutrition – Phase – II, III

Decrease the energy

- Sustain high egg production
- Maintain fat & breast muscles

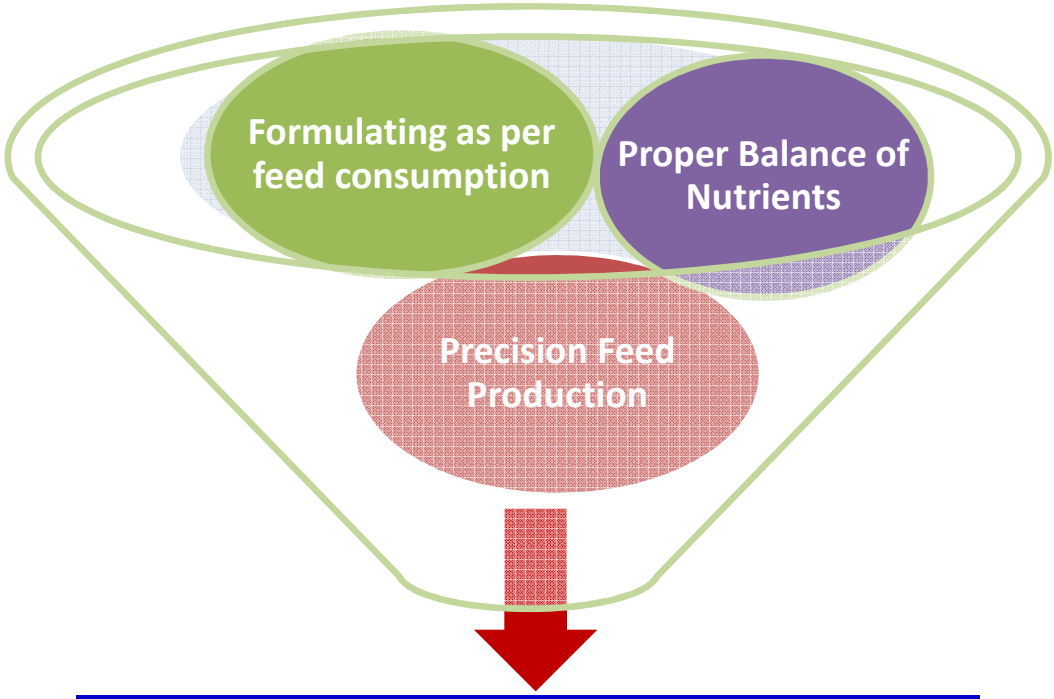
Phase – II, III Feed should be….

- Low in protein - to maintain egg size
- High Calcium & low in Phosphorus - Maintain egg shell quality

Make gradual changes in feed instead of immediate changes

Formulate as per feed consumption

Balanced Nutrition



Better Performance with cost Saving

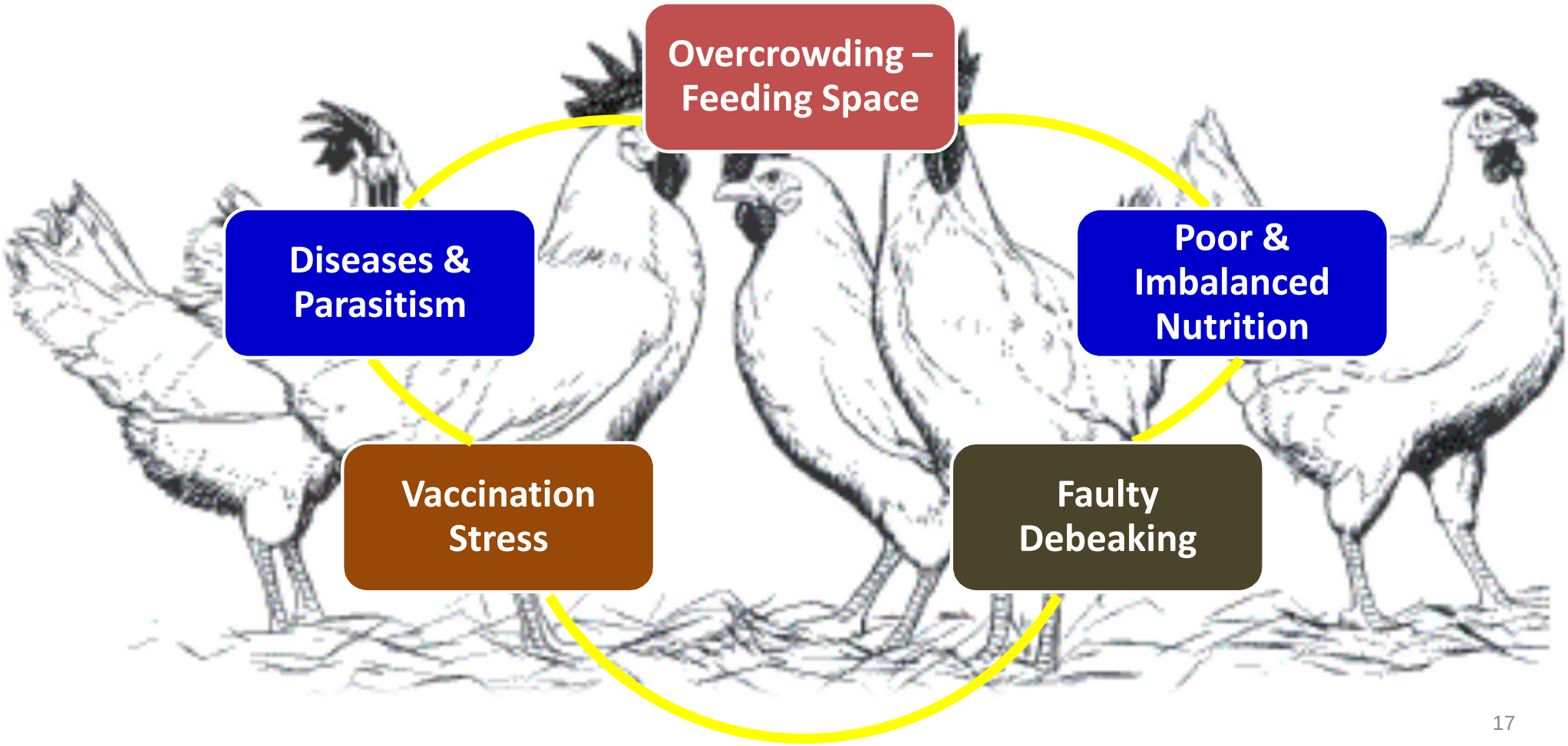
Uniformity

Uniformity

Body weight

1098 gm - 10% 1220 gm + 10% 1342 gm

Uniformity – Reasons for Poor Uniformity



Egg Shell Quality

Egg Shell Quality

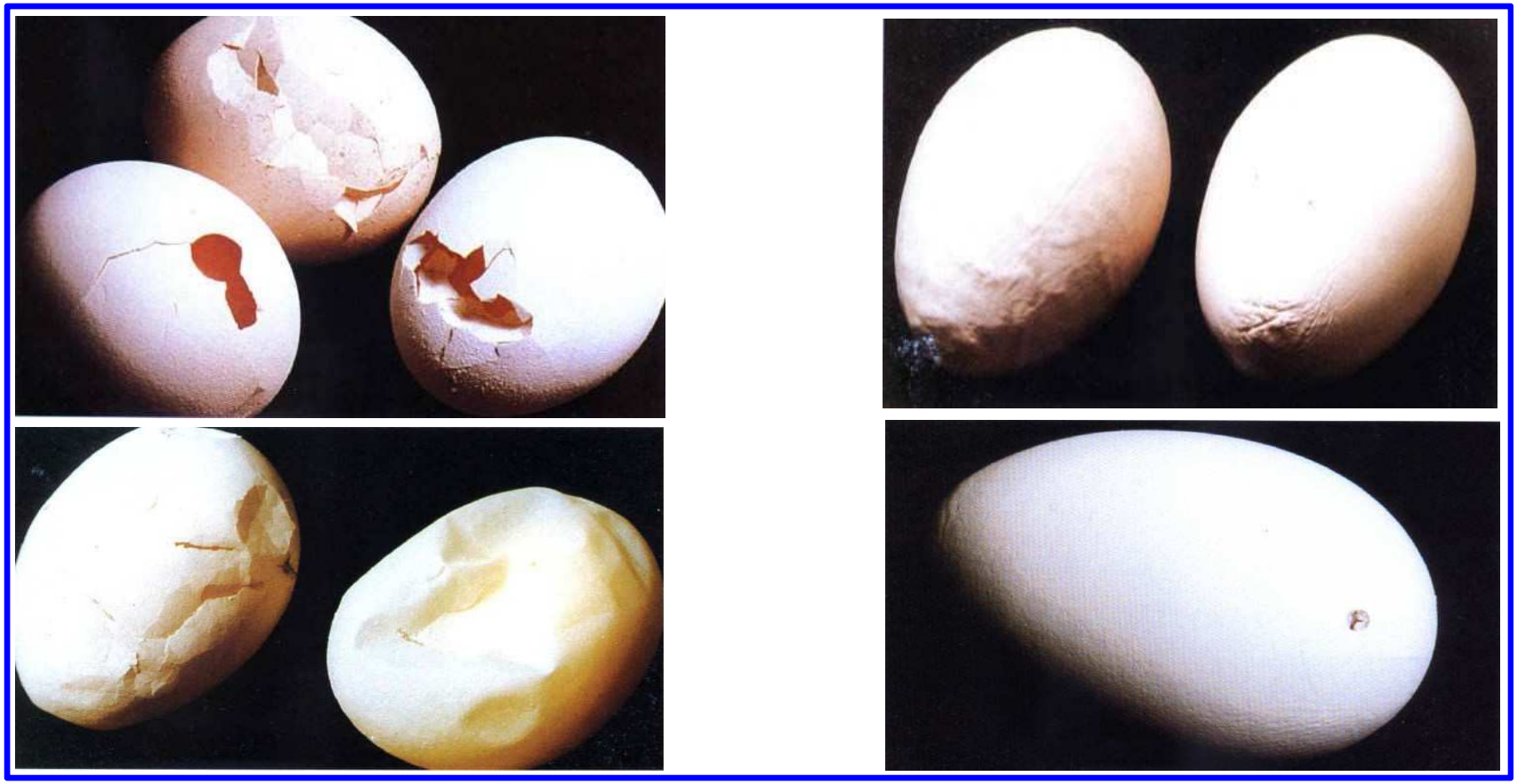
Egg Shell quality greatly dependant on skeletal condition of the layer

Hens with soft bones produce thin egg shells

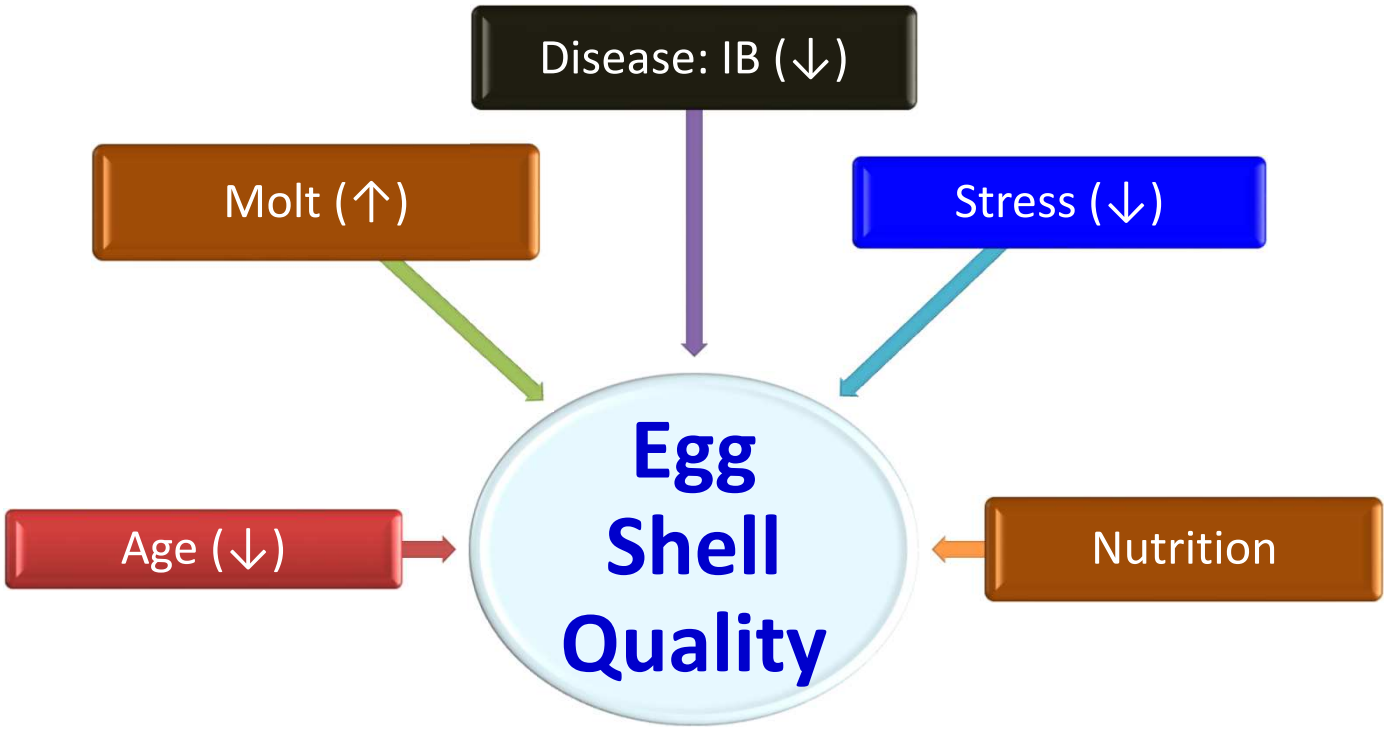
Low ca in feed will show results after 4 days of feeding.

High level of Available Phosphorus in feed.

Eggshells Quality



Eggshells quality



Importance of calcium source

Calcium Carbonate	Particle Size (mm)	Relative Solubility (%)
Extra Fine	Less than – 0.2	100
Fine	0.2 – 0.5	85
Medium	0.6 – 1.2	70
Coarse	1.3 – 2.0	55
Lagre	2.0 – 5.0	30
Oyster Shell	2.0 – 8.0	30

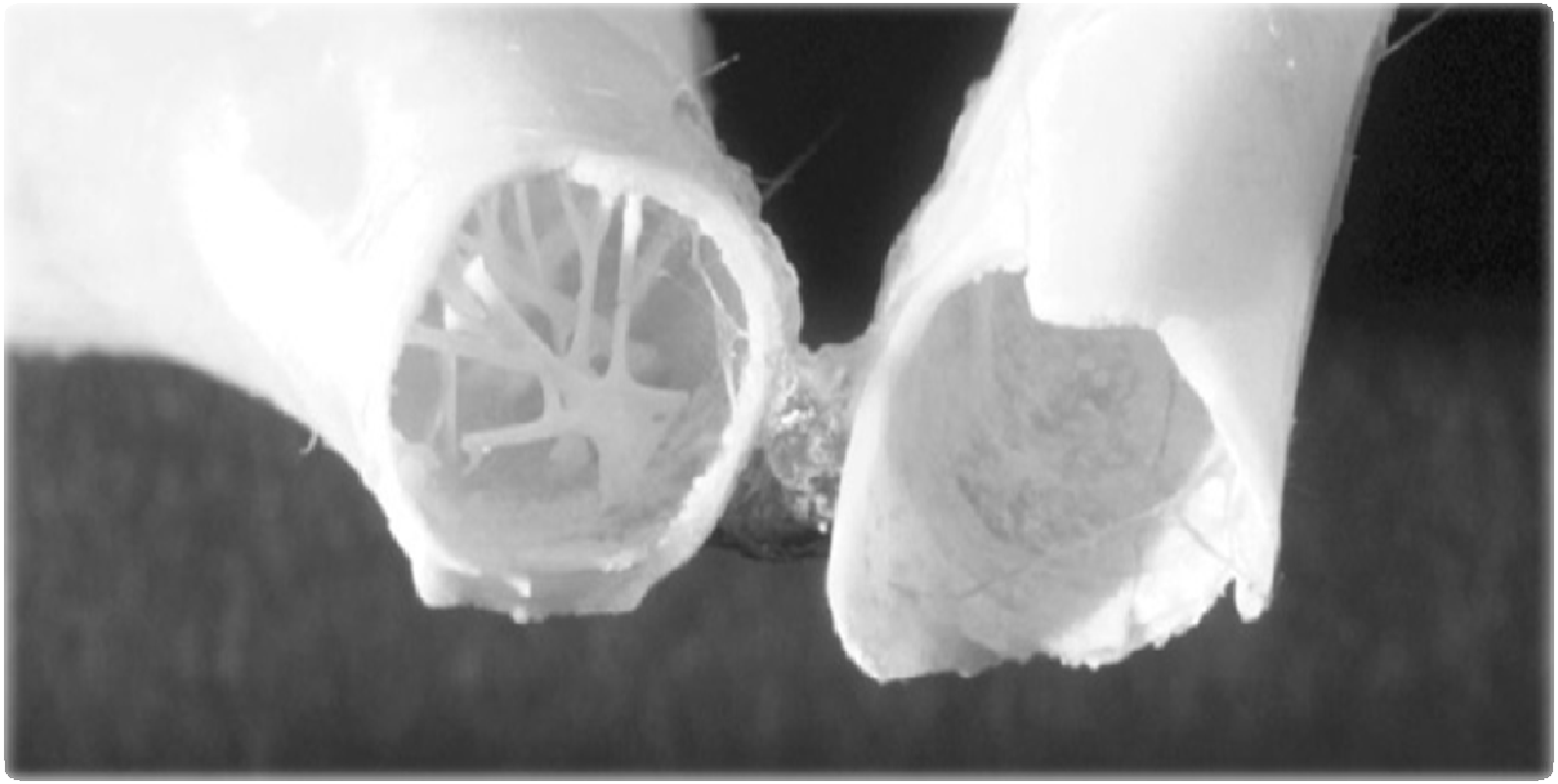
Lower the solubility greater the retention in the digestive tract

Ideal for growing chickens 0.3 - 0.4 mm

Medullar bone formation

Whitehead, 2004

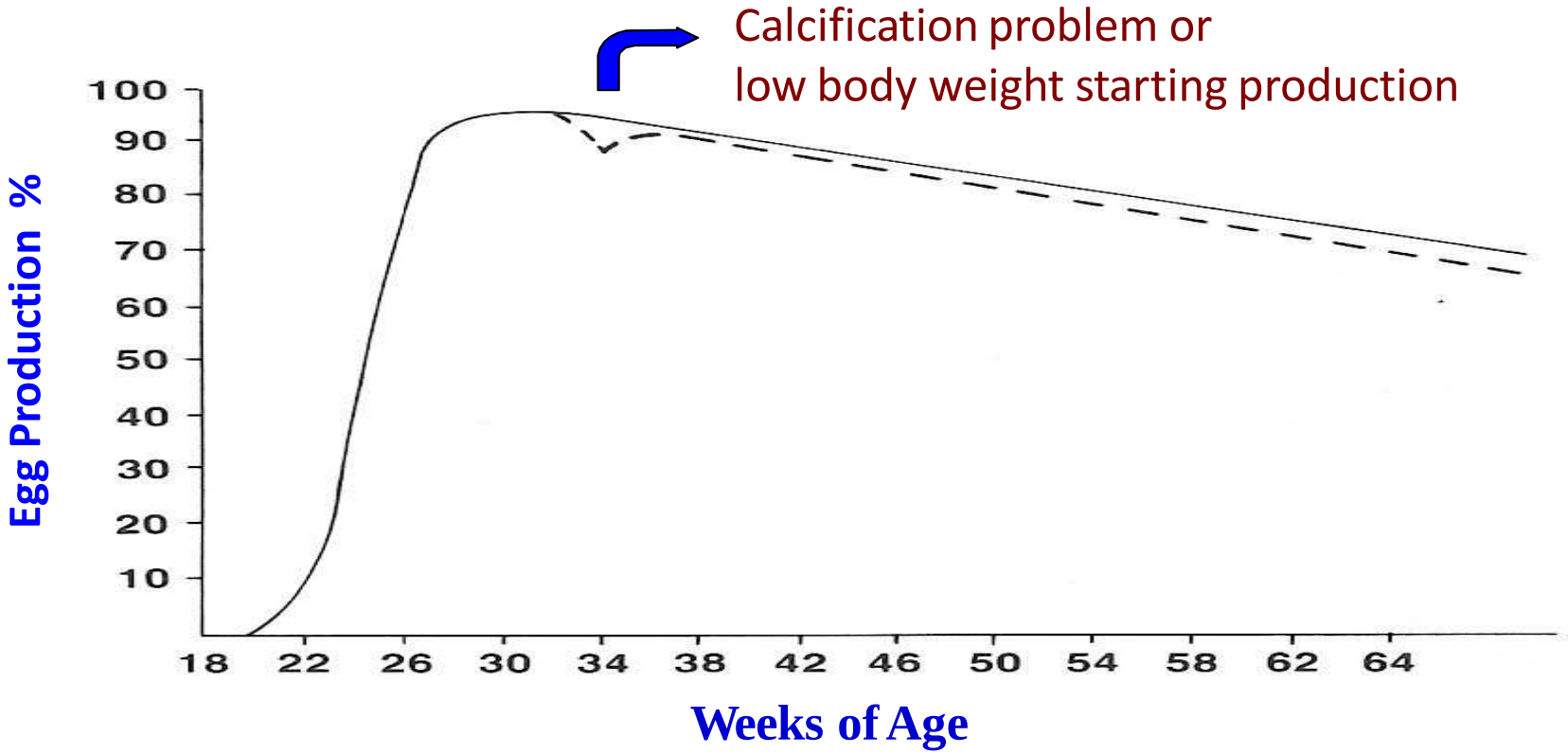
Loss of bone mass: medullar and structural



Whitehead, 2004

Loss of bone mass

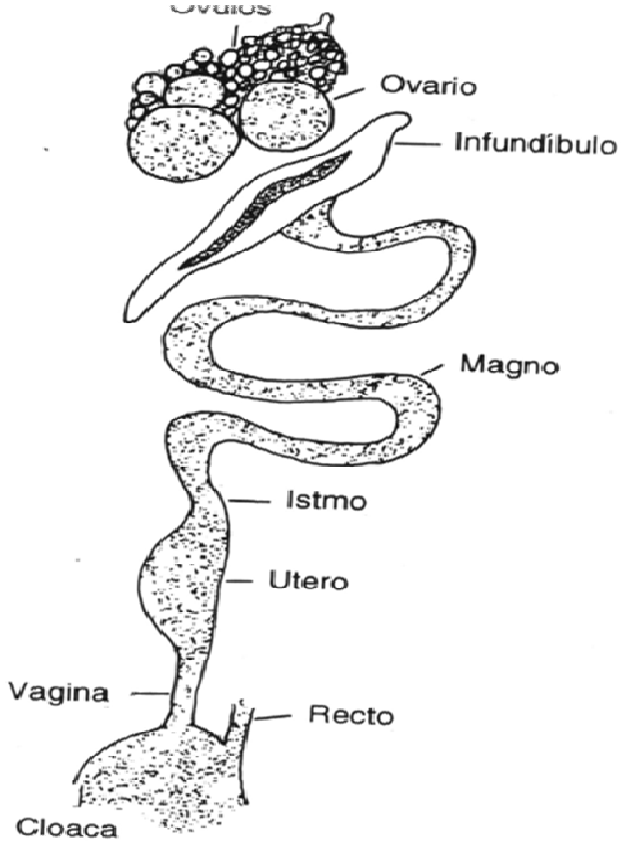
Decrease in egg production immediately after peak



Egg and eggshell formation

eggshell is formed at night

Part of Reproductive System	Time Required	
Infundibulum	15 Mins	Receive the yolk from ovary Site of fertilization
Magnum	3 Hr	Albumen secretion, which is deposit around the yolk
Isthmus	1 Hr	Shell membranes formation. Water and mineral salts secretion.
Uterus	20 Hr	Organic matrix formation and eggshell secretion
Cloaca/Vagina	1 Min	Ovoposition



First 6 Hrs - No Shell Deposition, 6 to 12 Hr – 400 mg, 12 to 18 Hrs – 800 mg, Last 6 Hrs – 500 mg (Slow Deposition)

Suggestions for good eggshell quality

Source of calcium in the diet

- **30 - 35 % - fine limestone - (0.2 - 0.5 mm)**
- **65 - 70 % - large limestone - (2.0 - 5.0 mm)**

Prevent excess available phosphorus from 40 to 60 (0.30 - 0.35%) and after 60 weeks of age (0.25%)

- **Limit the use of medullar bone calcium**

Reduce amino acid levels, especially methionine in the diet (280 mg/day) after 60 weeks of age.

Decrease egg size 1- 1.5 g

Calcium Intake decline with age but Calcium output does not.

Suggestions for good eggshell quality

Use of 25(OH)D3 or 1 alpha (OH)D3 as source of D3

- Increase retention of calcium
- Decrease mortality

Prevent the use of salty water (250 mg salt/liter)

- Limit the provision of carbonate in the uterus

Adequate levels of manganese (membranes and organic matrix) and zinc (carbonic anhydrase)

- Use organic minerals (chelated with amino acid)

Maintain the electrolyte balance

Suggestions for good eggshell quality

Management and Equipment

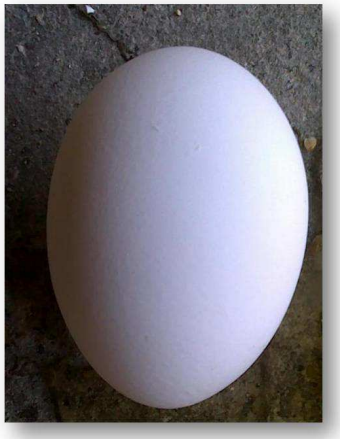
- Hens density
- Cage design
- Frequency of egg collection
- Sudden changes in light
- Transport and classification

Diseases prevention

- Infectious Bronchitis (IB)
- Egg drop syndrome (EDS)
- Newcastle Disease (ND)


Egg Size

Egg Size is affected by



- Body weight at sexual maturity
- Environmental conditions
- Mycotoxins
- **Nutrition** :
  - Linoleic Acid
  - Added fat/Oil
  - Amino Acids

Egg Size – Effect of Body Weight

Age In Week	Body Weight (Gm)	Egg Weight (Gm)
18	1.220	38.00
19	1.280	41.50
20	1.330	45.00
21	1.360	48.00
22	1.380	51.50

BV300L Manual

Egg Size – Effect of Environmental Temperature

	27.5 ° C	29.2 ° C	30.8 ° C
Daily Feed Cons (g)	114	102	101
Body Weight (Kg)	1.59	1.44	1.40
Small Eggs (< 60 gm)	32.30 %	48.40 %	56.30 %

Egg Size – Effect of Aflatoxin

Age In Week	Egg Weight 0 ppb AFB	Egg Weight 200 ppb AFB
22	51.50 g	45.80 g
26	55.50 g	49.80 g
30	57.20 g	50.50 g
32	57.60 g	54.60 g
22 - 32	55.45 g	50.175 g
Difference		5.275 g

Toxicity of **Aflatoxin B1** prevent mobilization of Lipids from Liver to the Ovary.

Ochratoxin – T-2 - Toxin

Dr.SSN Sep 2017

Based on - Azzam and Gabal 1998 Avian Pathology 27:570-577

Egg size & Methionine

Folic acid/betaine/choline/B12 ‘spare’ methionine for production by increasing reconversion

Cysteine cannot be converted to methionine, but methionine can be converted to cysteine

Both methionine & methionine + cysteine levels in feed are important

Methionine requirement must be fulfilled first

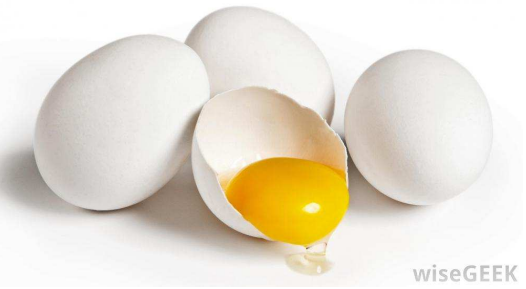
More methionine = more production

Egg Size – Linoleic Acid & fat

Maximum response in egg weight to linoleic acid is at level of 1.5% in the diet.

Oil or fat addition in young layer diets increases about 2.5 g the egg weight.

Maximum response in egg weight in the first phase of production with the supplementation of 2 a 4 % of added fat; being vegetable oils more effective than animal fat



Conclusions and recommendations

Egg shell quality can be improved by

- Extra coarse calcium
- Avoid too much phosphorus
- dEB around 225 – 275 mEq/kg
- Uniform particles to prevent demixing
- Extra Mg?

Egg weight can be affected by:

- Protein (CP -DAA and in lesser extent EAA as lysine and SAA)
- Linoleic acid or unsaturated fat (U/S ratio)
- Starch
- Phosphorus

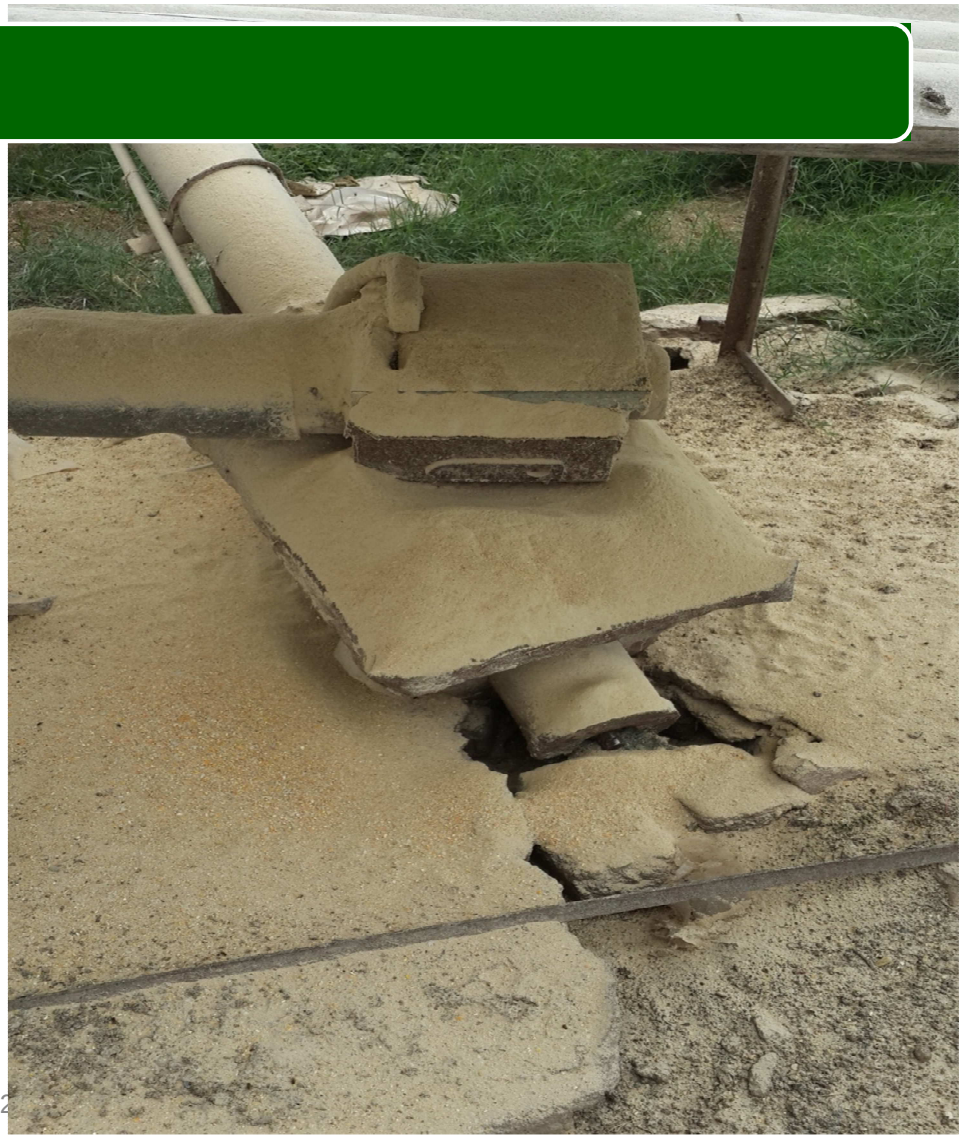
Premixing

Some observations - Feed Mill

Weighing Balance

Mixers

Feed Delivery



Why Premixing?

The requirement of micro ingredients such as vitamins, minerals, feed additives in the feed in ***very small quantities***

If these micro-ingredients are added directly to the mixer –

not getting properly disbursed in feed.

To avoid this, micro-ingredients are first premixed separately in an efficient small batch mixer to form a premix and again mixed with another feed ingredient to form a large portion of premix.

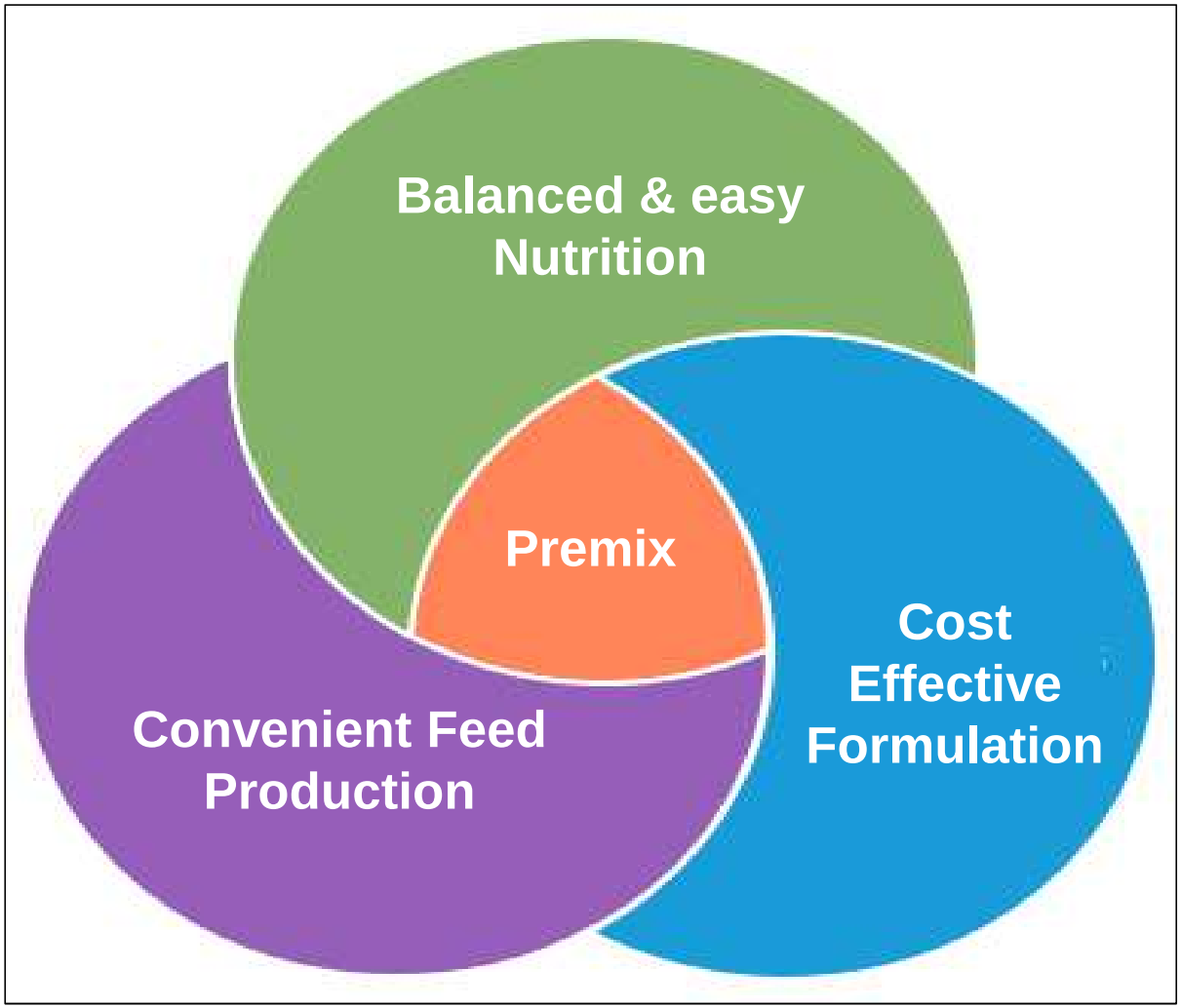
The premix is added to the main batch mixer to achieve uniform disbursement.

How to select a Best Premix

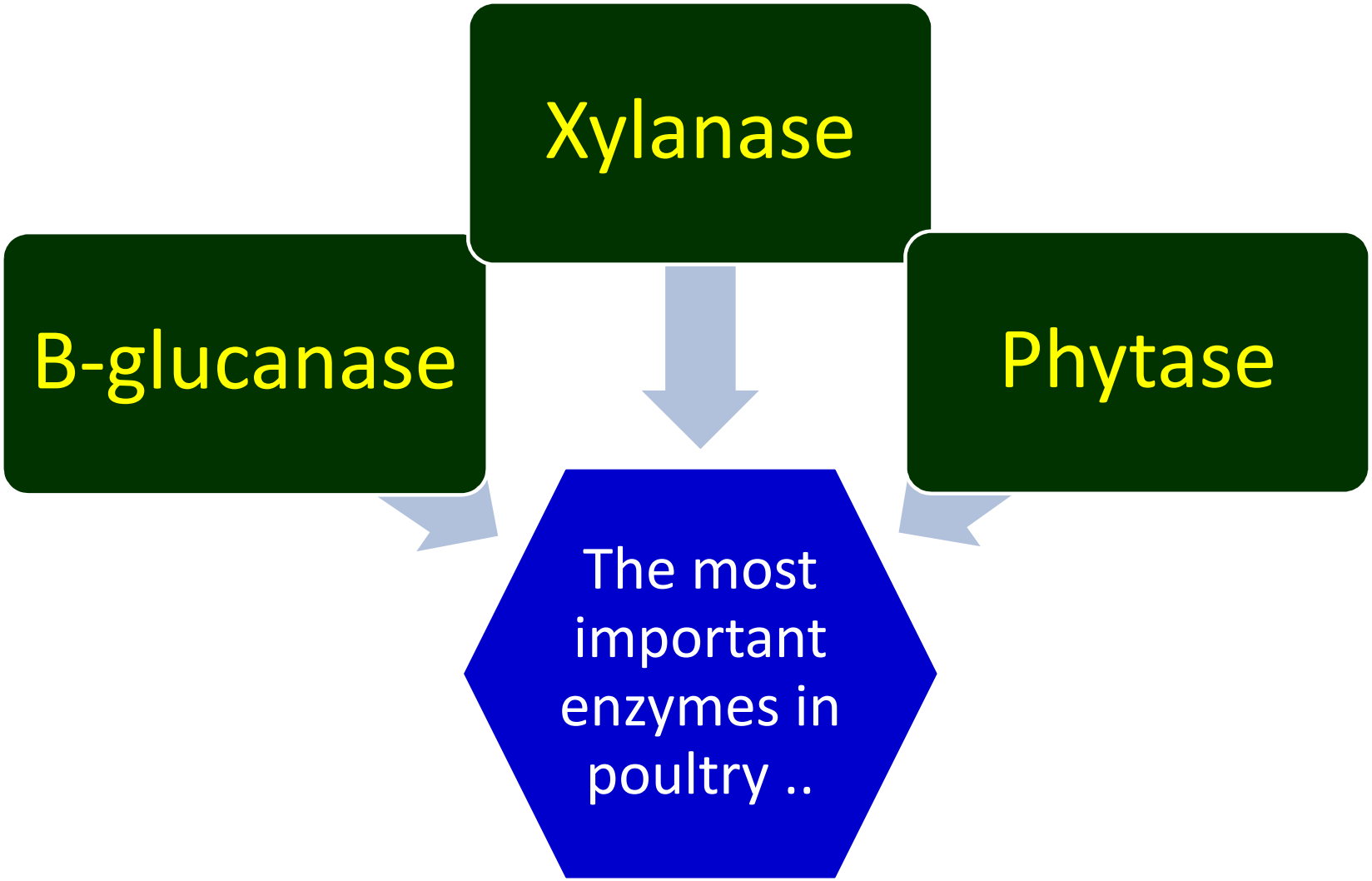
- Convenience of handling and storage
- Reduce the number of ingredients
- Increase batching efficiency and reduce batching errors
- Optimize micro-ingredient particle distribution in the feed
- Ensures homogeneous mixing

Premixing at field

Advantages of using Premixes



Enzymes


Xylanase
B-glucanase
Phytase
The most important enzymes in poultry ..

Considering matrix values will save feed cost

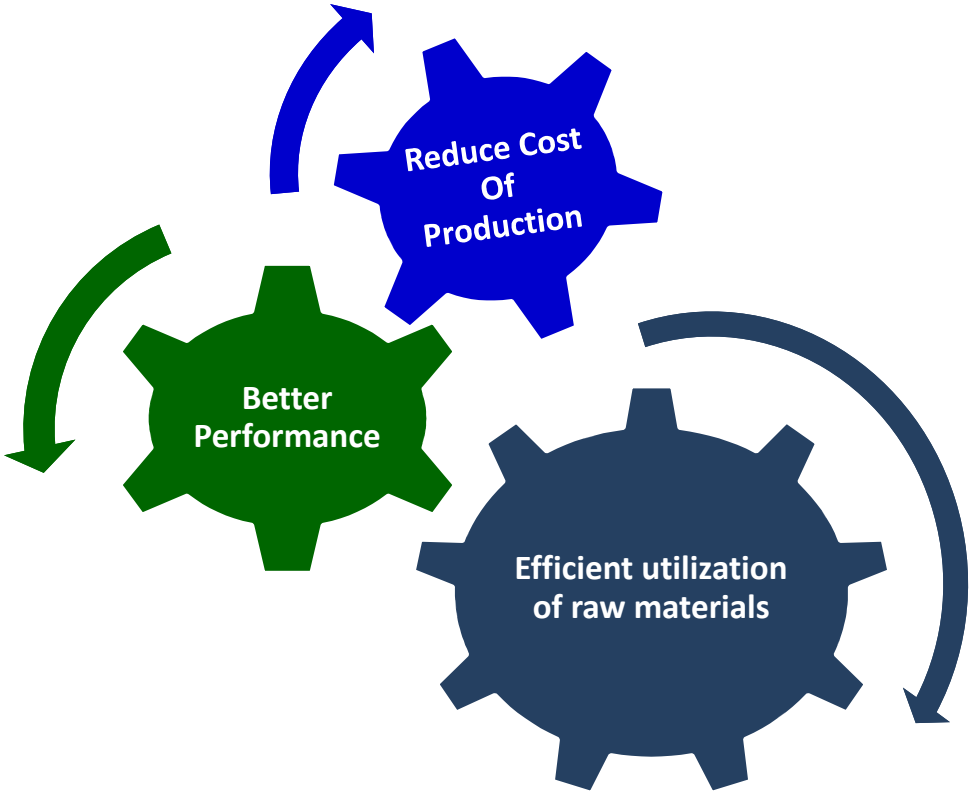
But matrix values must be reliable & proven

Feed Cost Saving with Matrix

Sr	Rs/Kg	Ingredients	with Normal Phytase	With New Gen Phytase	
1	13.00	Maize	58.480	55.415	
2	12.50	Broken Rice	3.880	5.000	
3	11.80	Deoiled Rice Bran		4.000	
4	36.00	Deoiled Soy	15.000	13.000	
5	28.00	GNE	5.000	5.000	
6	18.00	Sunflower cake	5.000	5.000	
7	1.50	Marble Grit	8.000	8.000	
8	3.00	Lime Stone Powder.	2.000	2.200	
9	37.00	DCP	1.300	1.050	
10	120.00	L-Lysine	0.140	0.165	
11	270.00	D.L.Methionine 98%	0.180	0.180	
12	90.00	Choline Chloride 60%	0.150	0.150	
13	70.00	Traceminerals	0.100	0.100	
14	400.00	Vitamin Premix	0.050	0.050	
15	5.00	Salt Pure	0.250	0.230	
16	33.00	SBC Pure	0.160	0.150	
17	130.00	Normal Phytase	0.010		
18	450.00	New Generation Phytase		0.010	
19	70.00	Livertonic	0.050	0.050	
20	85.00	Toxin Binder	0.100	0.100	
21	450.00	Probiotic	0.050	0.050	
22	130.00	Acidifier	0.100	0.100	
		Total	100.000	100.000	
		Rate	18.06	17.53	0.54

Nutrients	with Normal Phytase	With New Gen Phytase
ME Kcal	2616.22	2615.32
C.P	15.99	15.91
EE	3.064	2.994
CF	4.041	4.445
A/A	2.605	2.936
Ca	3.815	3.806
Av.P	0.432	0.435
Lysine	0.724	0.724
Met	0.406	0.406
Cystine	0.213	0.218
M+C	0.623	0.625
Thr.	0.472	0.466
Trypt	0.151	0.148
Arginine	1.028	1.009
Isoleu	0.561	0.534
Leu	1.204	1.165
Valine	0.658	0.654
Histidin	0.381	0.366
Phen	0.703	0.672
Na	0.188	0.192
Cl	0.210	0.200
K	0.636	0.637
Len.Acid	1.324	1.280
Choline	1.899	1.895
Ca:Ap	8.84	8.75
Lysine to CP %	4.53	4.55
Lysine to Met %	56.11	56.09
Lysine to M+C	86.02	86.37
Lysine to Threonine	65.18	64.37
Lysine to Tryptophan	20.90	20.38
Lysine to Aginine	141.95	139.41
DEB mEq=	185.52	190.09
Consumption (g)	105	105

Use Enzymes ….


Reduce Cost Of Production
Better Performance
Efficient utilization of raw materials


Bio - Security

Geographical Location of WB makes it more prone to Infections

West Bengal

Bio – Security at Farms

Disease Control Strategies

1

Limiting the challenge -
BIOEXCLUSION

+

2

Enhancing the Bird resistance -
IMMUNIZATION

+

3

Preventing the spread -
QUARANTINE

Mortality Disposal??

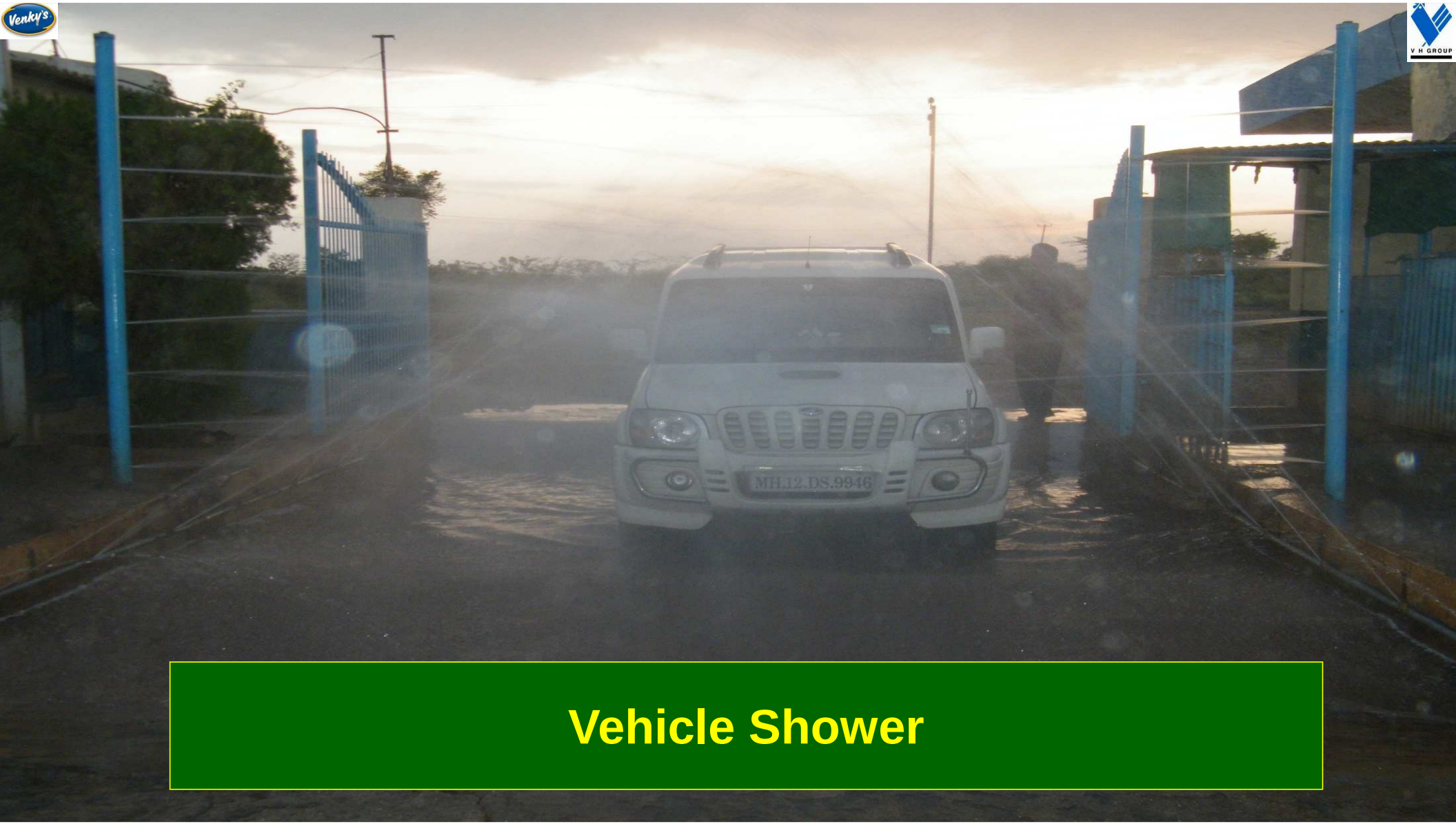
Culls/Ready Bird Vehicles

Vaccine/Diluent Bottle disposal

Clean secured premises


Venky's
V H GROUP


Potential Entry Point of Infection



Vehicle Shower


PANDIT AUTO
TATA
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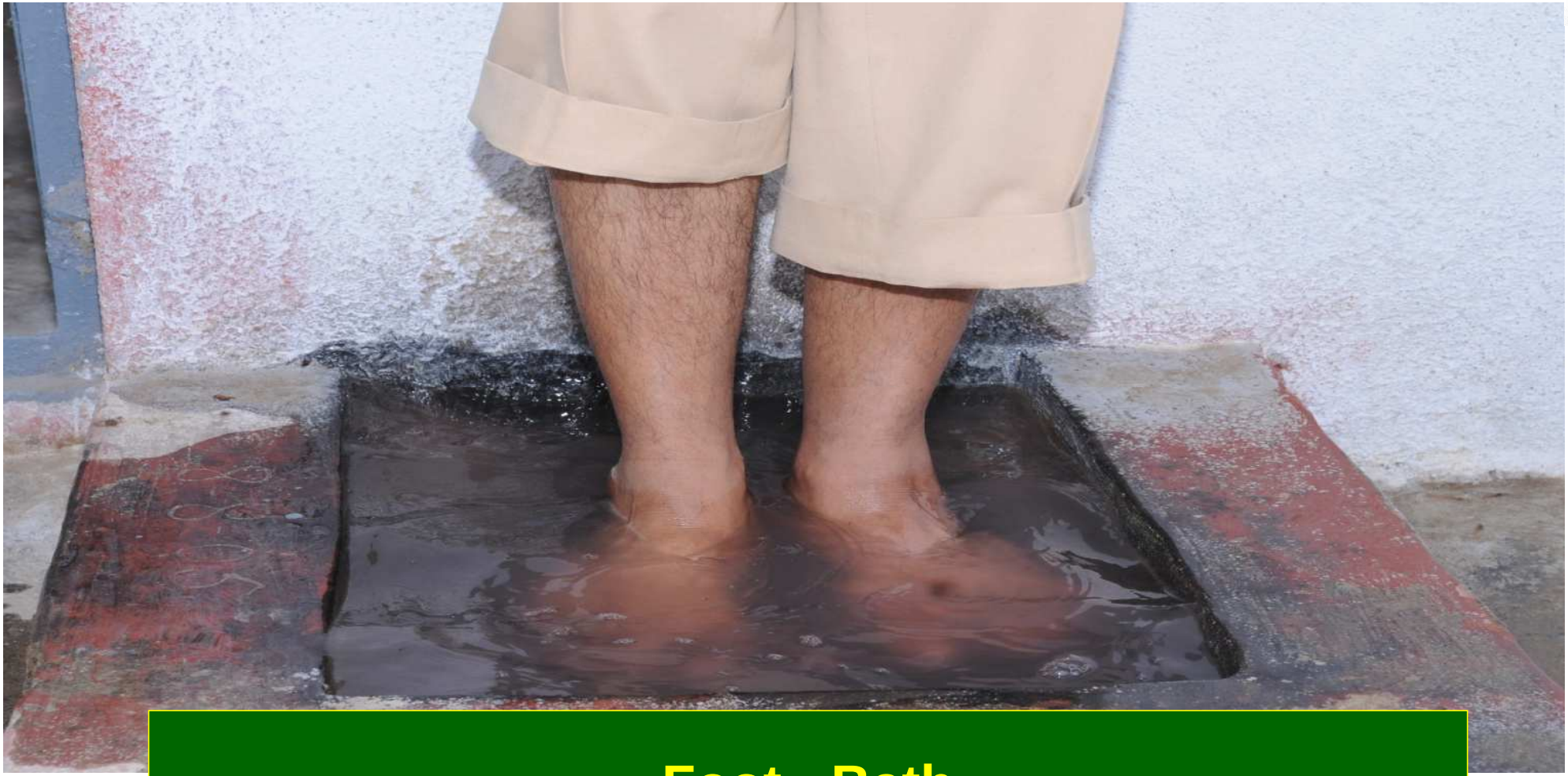
Foot - Bath



Foot - Bath

Mortality Disposal Pit

Always remember !!

Disease Prevention

Doesn't Cost ...

It Pays

Take home message….

Laying hens will continue to produce more number of eggs with extended laying cycle

Challenge to maintain good eggshell quality and egg size through – Genetics & Nutrition

Layer nutrition has a greater role ahead

Bio-Security needs to be maintained at all times.

Thank you for your attention