

Calcium in laying birds

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A complete feed for feeding to hens from 16 weeks of age.

ANALYTICAL CONSTITUENTS

Crude Oils & Fats	5.00%	Crude Protein	16.00%	Crude Fibre	4.50%
Crude Ash	11.00%	Calcium	3.3%	Phosphorus	0.44%
Sodium	0.18%	Moisture	13.80%	Lysine	0.80%
Methionine	0.37%	Methionine eq. value	0.37%		

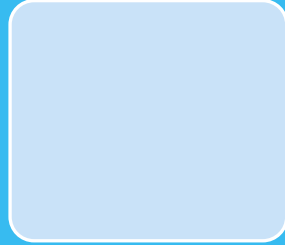
COMPOSITION

WHEAT, HIPRO SUNFLOWER SEED MEAL, CALCIUM CARBONATE, WHEAT FEED, SOY (BEAN) MEAL (GM*2), BAKERY BY-PRODUCT, EU DISTILLERS DRIED GRAINS, VEGETABLE OIL & FAT (GM*2), SODIUM CHLORIDE, MONO CALCIUM PHOSPHATE, SODIUM BICARBONATE

In Nature

- Immature Pullet ----- 1.15
gms/day
- Rooster ----- 0.74
gms/day
- On set of Lay ----- 2.60
gms/day
- During Lay ----- 3.80
gms/day

- Eggs contains 10-12% shell
- Average shell wt-6.2 gms
- Of this we have 38% calcium
- Approx 2.5gms calcium
- Absorption between 45 to 55% of total intake
- Daily intake between 4 to 4.5gms/day
- Older birds decreased absorption



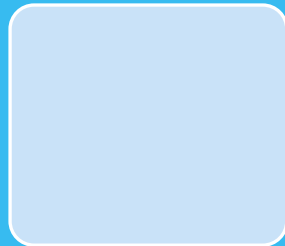
Changing Feeding Habits

- Omnivorous to Herbivorous
- Addition of Enzymes



Calcium Forms

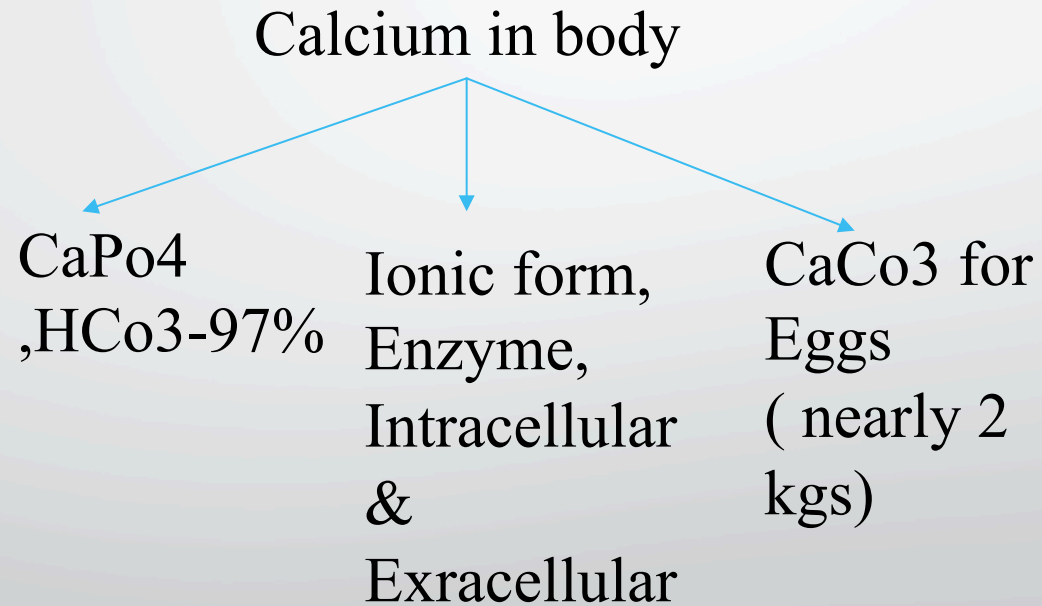
- Different sizes, forms and sources
- Uneven mixing



Breeding Practices

- Selection for Higher prod and size
- Selection for lower feed consumption

Calcium Metabolism



Calcium Levels

- Low levels/Deficiency
- Retarded Growth
- Rickets & Osteoporosis
- Haemorrhages
- reduced feed intake
- reduced activity
- Reduced egg size
- Thin shell
- Reduced production

- High levels/Excess
- Mainly like deficiency
- Egg splashes
- Thin shells
- Increased Perosis
- Uroliths as urates
- Cannibalism





Feed Intake

In addition to the development of the digestive tract during the rearing period, the feed intake will depend on the temperature and on the feed energy of the feed.

Estimation of the consumption according to the temperature and the energy level of the feeding per bird at the peak egg output

Temperature in °C	15	17.5	20	22.5	25	27.5	30
kcal./day/bird	328	319	310	301	292	283	274
Energy level of the feed	Feed Consumption per day and per bird						
2600	126	123	119	116	112	109	105
2650	124	120	117	114	110	107	103
2700	121	118	115	111	108	105	101
2750	119	116	113	109	106	103	100
2800	117	114	111	108	104	101	98
2850	115	112	109	106	102	99	96
2900	113	110	107	104	101	98	94

Feed intake will depend also on the palatability of the feed and therefore on the oil content of the feed and of the presentation on the calcium

Periods/ Age of the flock	18-32 weeks	32-45 weeks	After 45 weeks
Oil in %	2-25	1-1.5	0,5-1,0
Crude fibre	3,5-5,0%	4,0 – 5,0%	4,0 – 6,0%
Calcium in mg/day	4100	4200	4450
In powder form	30-40%	30-40%	30-40%
In particle form	60-70%	60-70%	60-70%
Av Phosphorus in mg/day	450 - 420	420-380	380-360
Sodium Minimum g/day	0,18	0,18	0,18
Chloride Minimun g/day	0,16 – 0,22	0,16-0,22	0,16 – 0,22
Potassium minimum g/day	0,60-0,80	0,60-0,80	0,60-0,80

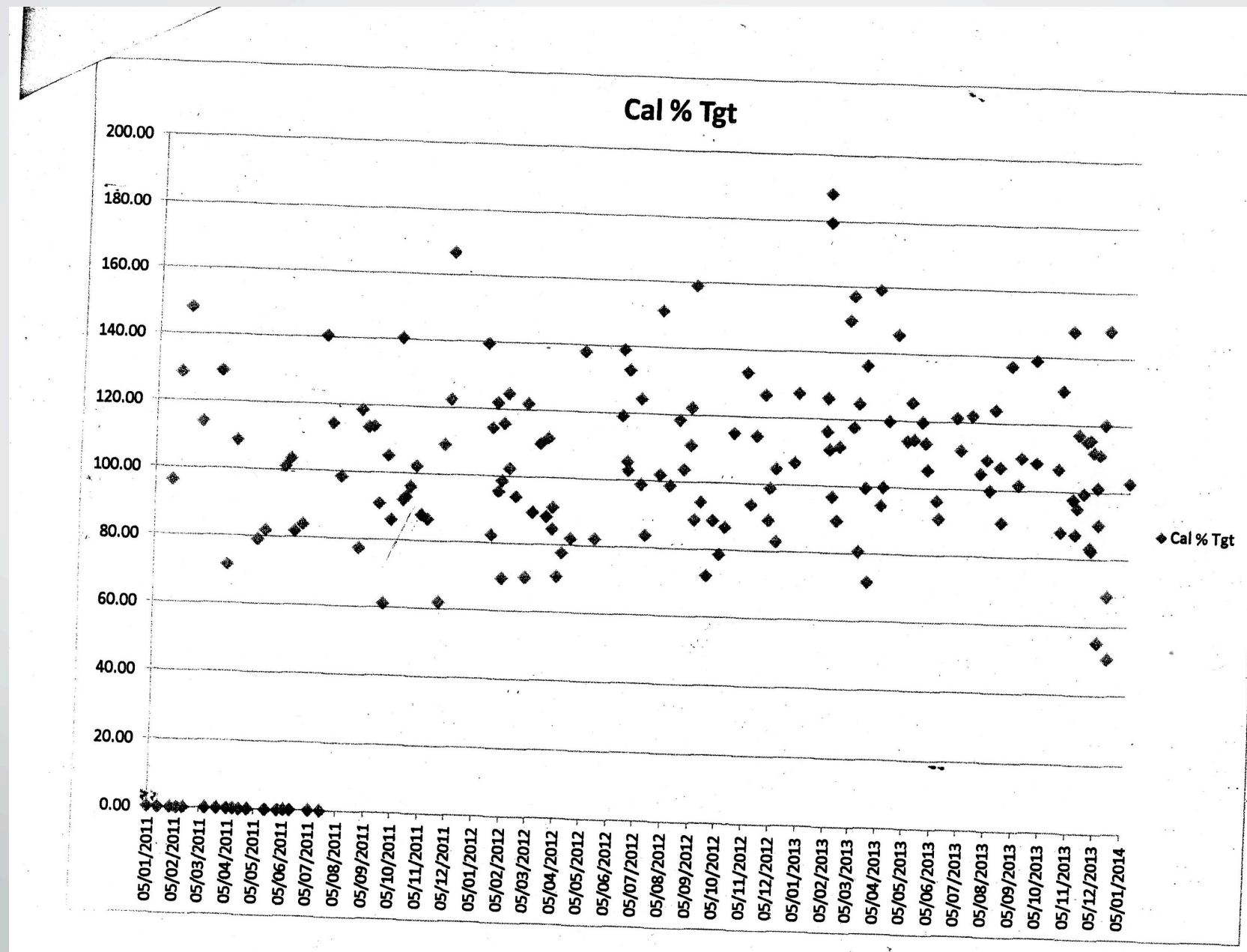
Feed specifications according to feed intake and age of the flock

FEED SPECIFICATIONS AT PEAK OF PRODUCTION TILL 32 WEEKS OLD								
Nutrients	Dig. Lys	Dig- Meth	Dig- M+C	Dig- Try	Dig- Arg	Dig- Thr	Calcium	Av Phos
In mg/day	800	430	690	180	990	550	4100	450
Av. Feed consumption in g	In mg/g of feed according to average feed consumption observed							
85	0,94	0,51	0,81	0,21	1,16	0,65	4,82	0,53
90	0,89	0,48	0,77	0,20	1,10	0,61	4,56	0,50
95	0,84	0,45	0,73	0,19	1,04	0,58	4,32	0,47
100	0,80	0,43	0,69	0,18	0,99	0,55	4,10	0,45
105	0,76	0,41	0,66	0,17	0,94	0,52	3,90	0,43
110	0,73	0,39	0,63	0,16	0,9	0,5	3,73	0,41
115	0,70	0,37	0,60	0,16	0,86	0,48	3,57	0,39

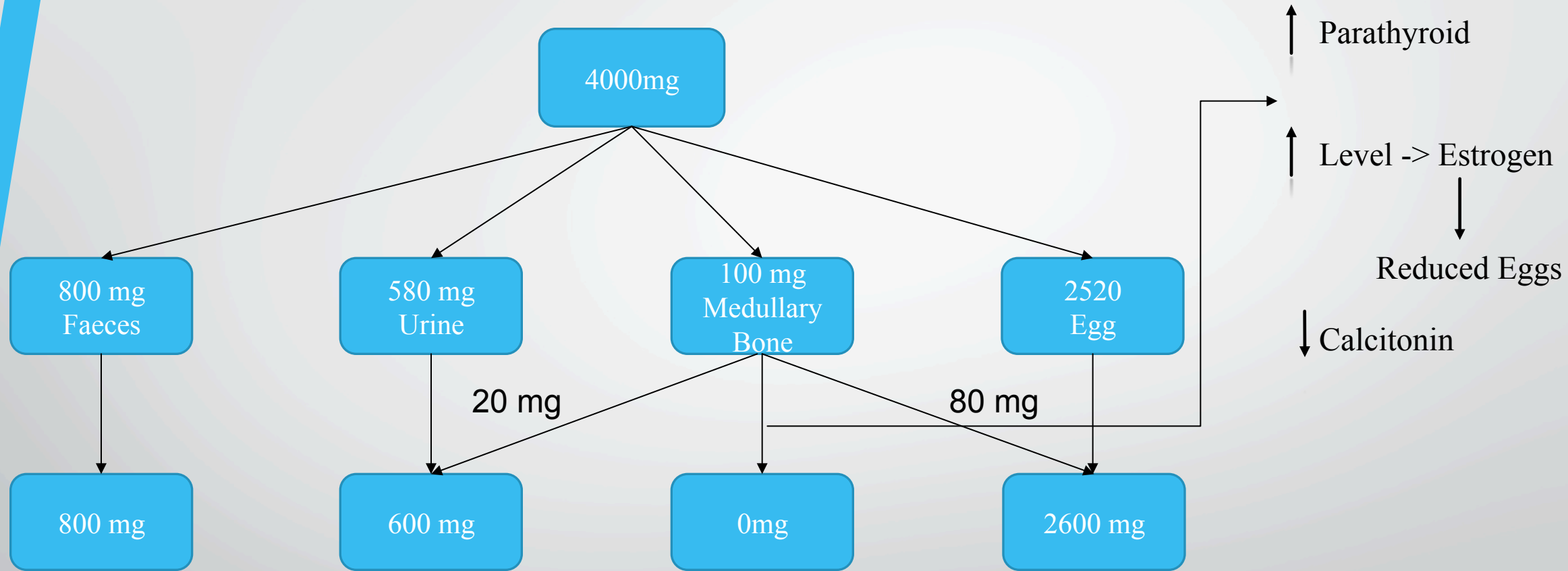
FEED SPECIFICATIONS AT PEAK OF PRODUCTION FROM 32 TILL 45 WEEKS OLD

Nutrients	Dig. Lys	Dig- Meth	Dig- M+C	Dig- Try	Dig- Arg	Dig- Thr	Calcium	Av Phos
In mg/day	800	430	690	180	990	550	4200	420
Av. Feed consumption in g	In mg/g of feed according to average feed consumption observed							
90	0,89	0,48	0,77	0,20	1,10	0,61	4,67	0,47
95	0,84	0,45	0,73	0,19	1,04	0,58	4,42	0,44
100	0,80	0,43	0,69	0,18	0,99	0,55	4,20	0,42
105	0,76	0,41	0,66	0,17	0,94	0,52	4,00	0,40
110	0,73	0,39	0,63	0,16	0,90	0,50	3,82	0,38
115	0,70	0,37	0,60	0,16	0,86	0,48	3,65	0,37
120	0,67	0,36	0,58	0,15	0,83	0,46	3,50	0,35
125	0,64	0,34	0,55	0,14	0,79	0,44	3,36	0,34

FEED SPECIFICATIONS FROM 45 WEEKS OLD								
Nutrients	Dig. Lys	Dig- Meth	Dig- M+C	Dig- Try	Dig- Arg	Dig- Thr	Calcium	Av Phos
In mg/day	788	424	680	177	975	542	4450	380
Av. Feed consumption in g	In mg/g of feed according to average feed consumption observed							
95	0,83	0,45	0,72	0,19	1,03	0,57	4,68	0,40
100	0,79	0,42	0,68	0,18	0,98	0,54	4,45	0,38
105	0,75	0,40	0,65	0,17	0,93	0,52	4,24	0,36
110	0,72	0,39	0,62	0,16	0,89	0,49	4,05	0,35
115	0,69	0,37	0,59	0,15	0,85	0,47	3,87	0,33
120	0,66	0,35	0,57	0,15	0,81	0,45	3.71	0,32
125	0,63	0,34	0,54	0,14	0,78	0,43	3,56	0,30



Calcium



Egg shell made of Calcium and Carbonate

- Shell Strength
- Resistance to breaking
- Specific gravity
- Shell thickness
- Shell shape and deformation
- Carbonate Metabolism
- Controlled by enzyme
- Carbonic Anhydrase
- CA is a Zinc based Enzyme
- In winters resp/rate is 29/minute
- High Temperature>>Hyper ventilation>>Reduced Blood level of CO₂>>thin Egg shell (by 12%)



Factors Affecting Egg Shell Quality

- Age of the bird
- Environmental Temperature
- Time of Lay

- * Misshapen eggs between 6am-8am
- * Best eggs during mid-day

- Stress
- Disease

- *IB
- *ND
- * EDS
- * Vent Gleet

➤ Mycotoxin

i) Aflatoxins(B1)

* Decreased production/ Eggs mass

* Egg size/mass

* Reduced hatchability

ii) T2

* Reduced Egg Shell Quality

* 3 to 15% cracked eggs

iii) Ergot Alkaloids

* Reduced Egg Production

➤ Drugs

Case study –High/low Calcium

- Flock 300,000 Broiler Breeders
- Feed with 3% calcium
- HE between 80 to 85%
- Water very hard
- 1500 to 2000 ppm
- Trail on one Farm
- Reverse Osmosis on one Farm
- Hatchable eggs 94%
- Flock size 40000 NovoBrown
- Peaked at 88% went to 85%
- Feed consumption 110(100gms) at 36wk
- Calcium content -3.3%
- Daily intake 3300mg
- Addition of 1% CaCO₃
- Calcium content -3.7%
- Production up by 5% in 2 wks
- Peak 90% at 38 wks

Only mineral water is given to birds, provided latest version of air conditioners, air circulators, foggers etc.

Enhanced parents holding both layers and broilers to meet the market demand.

Final Results to 70 weeks

Total no. of eggs	275 (284.1)
Total no of H.eggs	251(247.5)
Avg Hatch	38.97%
Act Chicks/Parent	97.81(94)
Corrected Hat%	41.97% - 14days eggage
Corrected Chicks/parent	105.34

Please see our website for use of organic minerals increased Zinc level by +14% -> higher CA level-> better shell quality->higher hatchable eggs->higher chicks/parent



Remember



- Bird in lay needs 4-4.5gms per day
- Absorption of calcium linked to P and Mn
- Each gram the bird eats less farmer saves 10p
- So a farm of 50,000 will make GBP 5000.00 extra
- Less wastage of nutrient in litter

Summary

- Using correct level of Ca,P and other minerals are very important
- Calculate daily intake during and Post peak
- Daily intake between 4 to 4.5gms daily
- All mineral are interlinked in absorption
- High/low level of Calcium can cause problem
- Inform/consult feed manufacture regarding feed consumption.