

SUMMARY:

Comparison between control groups of different breeds

BETWEEN CGs

- When compared between all breeds for MET, GHL, EST, PROG
EP the trend was V>G>A>N, V>A>N>G, V>A>G>N, G>N>V>A
MP the trend was V>G>N>A, G>V>N>A, A>V>N>G, G>N>A>V
- When compared between EP and MP the conc. of all hormones is greater at EP than at MP. In Aseel steroid hormones are more at MP than at EP.
- When mean BWs of CGs were compared between different breeds at 24 wk and 36 wks V>G>A>N, V>G>A>N. The trend for gain in body weight A>V>N>G whether the means at EP and MP were compared or the initial at EP and final at MP were compared.
- FI trend was V>A>N>G
- The trend for egg prod. % V>N>G>A at EP whereas at MP it was N>V>G>A, The increase in % prod. From EP to MP was 16%, 12%, 0.3% for N>A>V. In Ghagus decreased by 3%. For egg wt. V>N>G>A at EP; V>G>N>A at MP.
- For conc. of different aas in plasma the conc. of no. of amino acids was more in Aseel and Ghagus at EP (THRE, GLUT,MET,TYR,TRP, LYS, ARG and VAL) where as at MP Aseel and Vana followed by other breeds.
- The trend for FI V>A>N>G BW inversely proportionl for Ghagus and Aseel and directly proportional to V and Nico.

V- Vanaraja; A-Aseel; G- Ghagus; N- Nicobari

SUMMARY:

Effect of selenium supplementation on different parameters

Effect of Se treatment (TG) compared to CG

- At EP, the conc. of MET and GHL decreased in V and A and increased in G and N. Significant decrease and increase in V and N only for MET and A and G for GHL respectively.
- Conc. of EST increased in A and N decreased in V and G; being significant in A and V.
- Conc. of PROG. decreased in all the breeds except Aseel.
- At MP, conc. of MET,GHL and EST increased in all the breeds (TGs). MET significant in all.
- GHL was significant only in Aseel and not in other breeds.
- EST was significant only in Vana and Aseel.

- The concentration of PROG increased in Vana Aseel and Nicobari but significant only in Aseel. The decrease in PROG. level in Ghagus was significant.
- The mean BW increased significantly in Vanaraja at late EP and during MP.
- In Nicobari BW increased during late EP (28 weeks). Significant effect on BW was not observed in other breeds.
- The mean egg production % increased significantly during EP trend---G>A>V.
- No significant effect in Nico.
- AT MP significant increase was observed in Aseel only.
- At EP mean egg weight increased significantly in G and N. At MP only in V.
- Upon treatment with Se the no. of increased conc. of plasma amino acids at EP Was Nico(8), Vana (7) where as at MP Ghagus(11) Vana (14). In tissue at EP Vana(11), Aseel (6). At MP Ghagus (11), Nico(4).
- At EP treatment with Se increased expression of 3aats in magnum and in jejunum
- Only one increased. At MP only 1aat expression increased in magnum and jejunum *significantly in Vana.
- In Aseel at EP, two transporters expression decreased in jejunum. In magnum
- Expression of 3aats increased. At MP expression of only one aat increased significantly.in both J and M.
- In Ghagus at EP expression of three aats increased in Jejunum and two in magnum
- At MP, 2aats in magnum increased, whereas no effect in jejunum.
- In Nicobari at EP expression of 3 aat increased in jejunum but not significant, whereas in magnum 2aats expression increased. At MP expression of three aats increased in jejunum and magnum.

CONCLUSION

The concentration of different hormones were different among the breeds. They could be modulated by the addition of organic selenium (0.2ppm, selenium enriched yeast). Similarly gene expression levels of melatonin, ghrelin receptors; amino acid transporters, CAT, B^aAT, LAT2, LAT4 and amino acid levels were modulated. It is concluded that egg production percentage increased differentially by selenium supplementation through modulation of various physiological parameters.

Comparative Studies on
Different Factors
Influencing Egg
Production in Chickens



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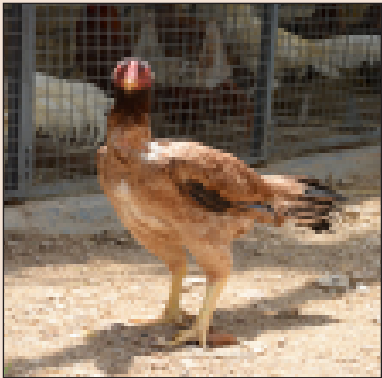
Pair of Vanaraja Birds

- The birds have mostly single combs, multicoloured plumage, yellow colour skin and shank and lays brown coloured eggs. Dual purpose bird.
- Adult body weight at 40 weeks of age ranges from 2.4 to 2.8 kg in female and from 3 to 3.5 kg in male.
- They produce up to 110-120 eggs per year.



Aseel Hen

- Aseel chickens have compact, firm, and muscular bodies held in a distinct upright position with strong shanks, majestic gait, short curved beaks, and broad skulls.
- The body weight of cocks is (3.79 kg) and hens (2.33 kg).
- The EP72 was 80 ± 6 eggs in a laying cycle of 72 wk.



Ghagus

- Found in the Kolar district, and adjoining locations of Karnataka and Andhra Pradesh.
- Annual egg production: 116.
- Adult B. W 1.6-1.8 kg.
- The birds are maintained largely for eggs and/or game purposes and reared in a backyard farming system.



Nicobari

- The bird is native to the Nicobar islands. Characteristics. Brownish matte in colour.
- Annual egg production 180-200.
- The birds are maintained largely for eggs.
- They are also reared under farm and field conditions.
- At 20 wks-1.2 kgs BW.



Melatonin

- Improves feeding efficiency, Promotes growth
- Eelevated cellular and humoral immune responses
- Enhances the intestinal absorption of AA
- Treatment increases egg weight and egg laying rate, Intestinal mucosal renewal
- Melatonin present in the egg yolk (approximately 70 pg/g) and albumen (approximately 20 pg/g)
- Level in the mucosa exceeds than that present in the blood (100-400 times)
- Increased the activity of antioxidant in the jejunum
- Down-regulates expression of GnIHR in the ovary

Ghrelin

- Ghrelin, an anorexigenic gut-derived peptide in chicken
- Implicated in supporting reproductive function at HPG axis
- High and low levels of ghrelin appear to be detrimental for fertility
- Able to reduce plasma progesterone (P) levels
- Ghrelin could influence chicken ovarian steroid hormones
- Importance of ghrelin in integrating nutrition and reproduction
- Expression and functional role of ghrelin in chicken ovary
- Plasma ghrelin levels were reduced by exogenous melatonin

Benefits of organic selenium in animal/poultry diets

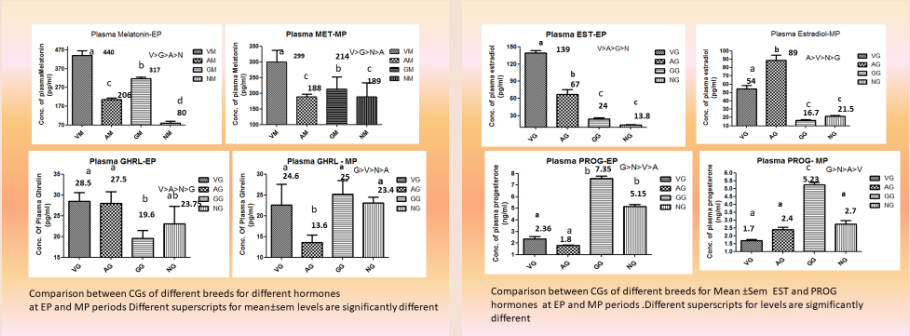
Helps in meeting Se requirement and maintain high

- Immunocompetence, Productive and Reproductive performance.
- Essential part of the integrated antioxidant system Selenoprotein family, in human, includes th following members: glutathione peroxidase (GPX1-GPX4 and GPX6), thioredoxin reductase (TXNRD1-2), thioredoxin-glutathione reductas (TXNRD3), iodothyronine deiodinases (DI01-3)

Objectives

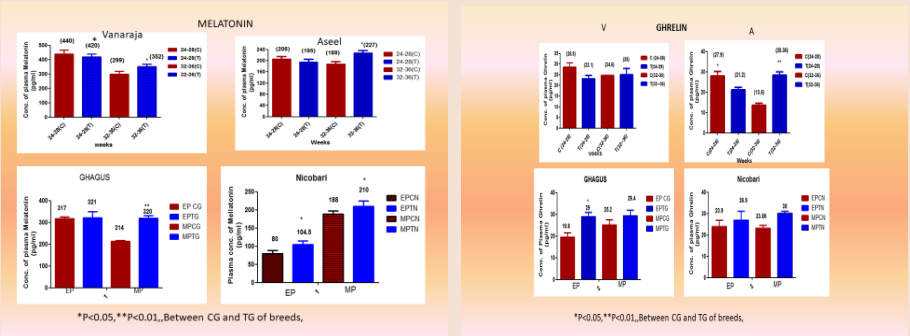
- To estimate Melatonin and Ghrelin in plasma and their receptor expression in jejunum and magnum of Vanaraja an native breeds (Assel, Ghagus and Nicobari) during early and peak laying period.
- To study relationship between level of hormones, amino a expression of amino acid transporters and differential egg production at two different phases of laying period.
- To observe the effect of supplementation of organic seleni in modulation of different paramotors mentioned.

Concentration of different hormones in the control groups



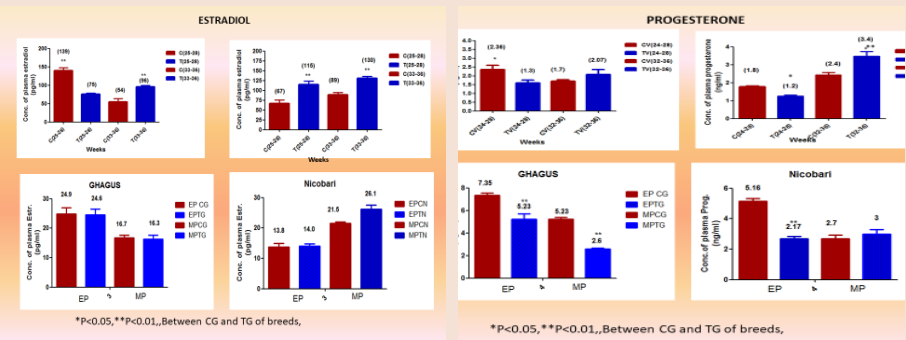
V-Vanaraja, A- Aseel, G- Ghagus, N- Nicobari

Effect of selenium supplementation on plasma Melatonin and Ghrelin



CG- control group, TG- Treatment group, EP- 24-28 weeks of age, MP- 32-36 weeks of age

Effect of selenium supplementation on plasma estradiol and progesterone



CG-control group, TG-Treatment group, EP-24-28 weeks of age, MP-32-36 weeks of age

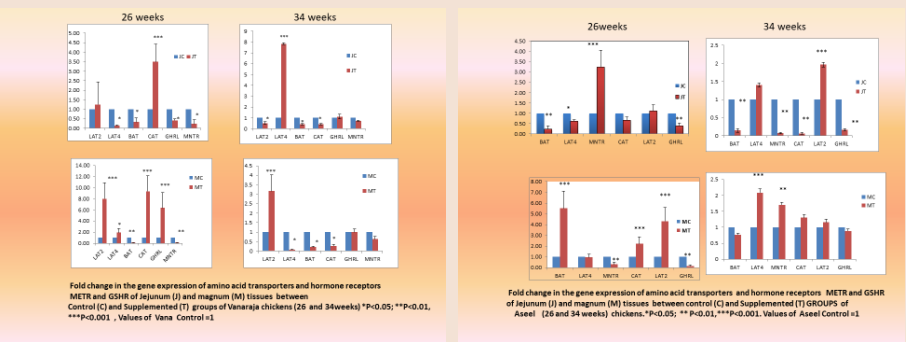
Egg production percentage and weights of different breeds

Egg production(%) and Egg wt(g) of different breeds at EP and MP (CGs)				
	Vanaraja	Aseel	Ghagus	Nicobari
EP (V>N>G>A)				
Egg%IC	62.5±1 *	22±0.5 *	43.5±1.2 *	62.2±1.2 *
V>N>G>A				
Eggwt (g)C	44 *	37.4 *	39.95 *	41.85 *
MP (N>V>G>A)				
Egg%IC	62.8±0.9 *	34 **±0.5 *	40.5**±0.9 *	78.7**±1.0 *
V>G>N>A				
Eggwt (g)C	51.6 * ***	44.1* **	47.6 *	46.6 *
Different superscripts for mean±sem values in a row are significantly different. *P<0.05,**P<0.01,***P<0.001, for values within a column are significantly different				

Comparison between CG and TG egg% and egg wt. with in a breed at EP and MP				
	Vanaraja	Aseel	Ghagus	Nicobari
EP (G>A>V)				
Egg%IC	62.5±1*	22±0.5*	43.5±1.2 *	62.2±1.2 *
Egg%IT	65.4±0.8**	31***±0.6	57.5***±1.3	62.3±1.30
Eggwt (g)C	44*	37.4*	39.95*	41.85*
Eggwt (g)T	44	37.6	42.54**	43.73*
MP(A>V>N>G)				
Egg%IC	62.8±0.9*	34±0.5 *	40.5±0.9 *	78.7±1.0 *
Egg%IT	64.1±0.8	37.5**±0.6	44.0**±0.8	80.3±1.5
Eggwt (g)C	51.6*	44.1*	47.6 *	46.6 *
Eggwt (g)T	53.6**	44.6	47.8	47.4
*P<0.05,**P<0.01,***P<0.001,Between CG and TG of breeds, different super scripts with in a row significantly different: between CGS of different breeds				

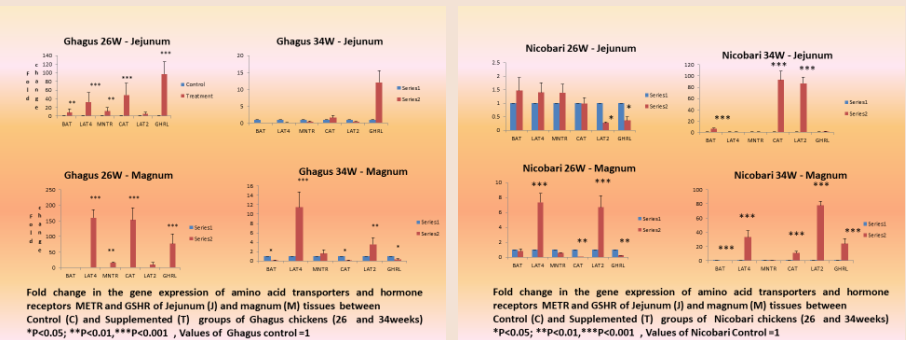
V-Vanaraja, A-Aseel, G-Ghagus, N- Nicobari, CG-Control group, Tg-Treatment group

Fold change in the gene expression levels of jejunum and magnum tissues



MNTR- Melatonin receptor; GHRL- Ghrelin receptor; CAT, BoAT, LAT2, LAT4- amino acid transporters

Fold change in the gene expression levels of jejunum and magnum tissues



MNTR-Melatonin receptor; GHRL-Ghrelin receptor; CAT, BoAT, LAT2, LAT4-amino acid transport