Analysing the variation in haemotology of herbo chicken with vaccinated native chicken in erode District of Tamil Nadu, India

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ABSTRACT: Native chicken rearing is gaining momentum among the poultry industry. But still there is a challenge of antibiotic residues in meat and more use of Biologicals, for which Herbo Chicken rearing might be the solution. Instead of use of Biologicals and antibiotics, native Chicken are fed with herbs like *Justicia adhatoda, Osmium basilicum, Piper betle, Plectranthus ambonicus, Solanum trilobatum, Sesbania sp., Moringa oleifera, Delonix elata, Carica papaya, Azadirachta indica, Murraya koeniggi, Acalypha indica, Andrographis paniculata, and Achyranthus aspera* based on the indigenous knowledge on ethnovetrinary medicine. This study was conducted to assess the difference in Haemlotological parameters of Herbo Chicken over The vaccinated Native Chicken flocks in Erode district of Tamil Nadu. Blood samples from 10 birds of 1.5 years of age each from regularly vaccinated native chicken flock and native chicken reared without vaccination and antibiotics in Sree Sakthi Native Chicken Farms, Erode were collected for this study. The haematological Parameters like Haemoglobin content, PCV, TEC and DLC were estimated using the standard protocol. The results obtained were analysed by conventional analysis in the form of averages and statistical analysis between both the groups were capmared by unpaired student't' test. The results revealed that there was a statistically significant variation at 5% level ($p<0.05$) in Haemoglobin Content and PCV of Herbochicken with that of vaccinated Native Chickens. Statistically there was no significant ($p>0.05$) variation between Herbo Chicken and normal vaccinated flocks among other blood parameters like number of RBCs, Neutrophils, lymphocytes, Monocytes, Eosinophils and Basophils. This study found significantly increasing the Haemoglobin content and Packed Cell Volume in the herbo chicken and there is no reported disease outbreak in the farm as per farm records. A further study on factors responsible for disease resistance may be recommended.

Key words: Herbo chicken –herbs –Haemotological parameters

Herbo Chicken is the term used to describe group of native chicken birds reared without using Vaccinations and medicines for treatment of diseases. Instead they rear birds using a decotion made up of variety of herbs which includes *Justicia adhatoda, Osmium basilicum, Piper betle, Plectranthus ambonicus, Solanum trilobatum, Sesbania* sp., *Moringa oleifera*, *Delonix elata*, *Carica papaya*, *Azadirachta indica*, *Murraya koeniggi*, *Acalypha indica*, *Andrographis paniculata, and Achyranthus aspera*. Haemotology is a branch of biological science which deals with the diagnosis, treatment and prevention of diseases of blood and bone marrow as well as of the immunologic, hemostatic and vascular systems. The parameters studied in this research are amount of Haemoglobin, Packed Cell Volume, Total Erythrocyte Count and Differential Leukocyte Count. Haematological values in birds are influenced by age, sex, breed, climate, geographical location, day length, time of day, nutritional value, and some physiological factors (Islam *et al*., 2004). The extensive use of antimicrobials in the poultry industry for disease prevention and as growth promoter further triggers the mechanisms that lead to the emergence of drug-resistant strains of bacteria (Bhuvan *et al*., 2013).For this instance world should opt for techniques to produce poultry meat without traces of antimicrobials for which herbo chicken rearing serves the purpose.

MATERIALS AND METHODS

The health aspects of bird can be calculated using the hematological parameters with that point of view these parameters are compared between 10 number of non-vaccinated herbo chicken from Sree Sakthi Native Chicken Farm fed with immune boosting decotion and the randomly selected native birds of same location that follows Normal Vaccination Schedule so that we can study the effect of feeding of these herbs in health status of birds. The decotion which is given weekly once in herbo chicken is made out of following ingredients *Justicia adhatoda* leaves (2 g), Basil leaves (5 g), Beetal leaves (3 nos), *Solanum trilobatum* (Thoothuvalai) leaves (3 g), *Sesbania* (Agathi) leaves (10 g), *Moringa* leaves (15 g), *Delonix elata* (Vatha narayana) leaves (2 g), Mexican mint (Karpooravalli) leaves (5 leaves), Papaya leaves (5 leaves with stem), Neem leaves (3 g), Curry leaves (2 g), *Acalypha indica* (Kuppaimeni) leaves (5 g), *Andrographis paniculata* (Siriyanangai) leaves (5 g), *Achyranthus aspera* (Naayuruvi) leaves (2 g), Ginger (10g), Garlic (10 nos), Turmeric tuber (2 nos), Cinnamon (pattai) (1 nos), Cloves (kirambu) (3 nos), Fennel seeds

(sombu) (1 g) and Poppy seeds (kasa kasa) (1 g), The decotion is diluted with water and given through the nipple waterer. This is the rearing practise followed in the farm selected for study. On the other hand 10 Native chicken reared at same age group and locality randomly selected and are properly vaccinated against RD and MD in the Erode District.

For the Haemotological study, blood is collected from wing vein and stored with EDTA Vacutainer blood collection tubes. The Blood collection site is sterilized with cotton and surgical spirit and 2 cc Syringe with 24 Gauge needle is used to withdraw blood from birds. Seperate needles and syringes are used to collect blood from each bird. The blood is preserved in EDTA containing Vacutainer tubes. Haemaglobin content was determined by Sahli Method (Prasanth *et al*., 2013). Microhematocrit method followed for results interpretation of Packed Cell Volume (Chandra *et al*., 1985). Neubaur's Haematometry with Nambiar Fluid for dilution(1 ml of Sodium citrate + 2 ml of Gentian Violet + 1 ml of Brilliant blue + 3 drops of Neutral Buffered Formalin) is carried out for Total Erythrocyte Count and results are interpreted (Ripon *et al*., 2013). Leishman's staining is done and results are interpreted for Differential Leukocyte Count (Kumar *et al*., 2013).

RESULTS AND DISCUSSION

The results obtained were analysed by conventional analysis in the form of averages and statistical analysis between both the groups were compared by unpaired student't' test. The results revealed that there was a statistically significant variation at 5% level ($p<0.05$) in Haemoglobin Content and PCV of Herbochicken with that of vaccinated Native Chickens. Statistically there was no significant ($p>0.05$) variation between Herbo Chicken and normal vaccinated flocks among other blood parameters like number of RBCs, Neutrophils, lymphocytes, Monocytes, Eosinophils and Basophils. (Note RBC is nearing significant statistically). The Herbo chicken method of rearing found to be fruitful in immune boosting mechanisms and there is no incidence of poultry diseases that are endemic to the geographic location like

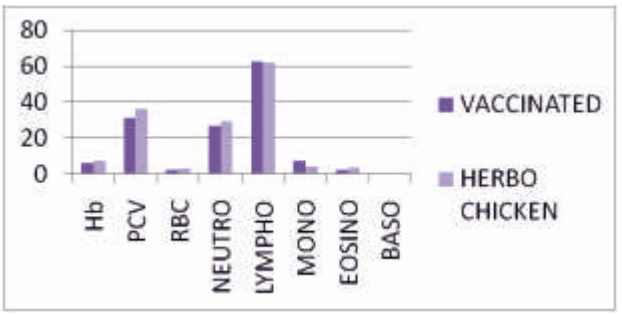

Fig 1: Comparison of mean values of blood parameters between herbo chicken and vaccinated flocks

New Castle's disease, Infectious Laryngeotracheitis and Marek's disease as per farm records. On the other hand there is vaccination failure which reported in vaccinated flocks and there is prevalence of these diseases which is recorded.

All the herbs used were found to have phytochemical substances like tannins, polyphenols, and phytates which are proven to increase the iron uptake both clinicallly and non-clinically. Thus Hb content, PCV and RBC values are high comparatively in Herbochicken. Despite the herbs used also have anti-inflammatory, anti-toxic, anti-oxidant, antimicrobial and anti-carcinogenic effects. Thus disease resistance is present in flocks of Herbo chicken innate. The factors responsible for increase in Iron content and thereby Haemoglobin content are accounted to the presence of Phytic acid, phytates, Ascorbic Acid, Polyphenols and Tannic Acid in the herbs used (Cercamondi *et al*., 2013; Gillooly *et al*., 1983; Thankachan *et al*., 2012). There is no significant difference in values of Neutrophils, Basophils, Lymphocytes, Eosinophils and Monocytes which defines that immunological status of both group is same at the point of collection. This may be due to the fact of incidence of disease in the herbo chicken farm selected and no previous disease history in the vaccinated flocks selected. Further studies like exposure of antigen to the birds and interpreting antibody titre are warranted to confirm the effects of these herbs in immunological system of these birds.

Table1: Results of student unpaired 'T' test

Variables	Vaccinated			Herbo Chicken			T - Test	P - Value	Result
	N1	Mean(X)	±Se(X)	N2	Mean(Y)	±Se(Y)			
Hb	10	6.41	0.3954	10	7.72	0.4379	2.22	0.0395	*
Pcv	10	31.00	1.3416	10	36.00	1.6465	2.35	0.0301	*
Rbc	10	2.69	0.1609	10	3.13	0.1438	2.04	0.0564	Ns
Neutro	10	26.80	2.2251	10	29.50	1.9221	0.92	0.3706	Ns
Lympho	10	62.20	2.4576	10	61.90	1.3204	0.11	0.9156	Ns
Mono	10	7.60	1.0770	10	4.30	1.3585	1.90	0.0731	Ns
Eosino	10	2.70	0.8172	10	3.50	1.1081	0.58	0.5684	Ns
Baso	10	0.70	0.3350	10	0.80	0.2906	0.23	0.8241	Ns

CONCLUSION

Use of these herbs has found significantly increasing the Haemoglobin content and Packed Cell Volume in the herbo chicken and there is no reported disease outbreak in the farm as per farm records. A further study on factors responsible for disease resistance may be recommended. If found disease resistance, with the introduction of practices of Herbo Chicken on Large scale, there is no need or limit the need of Biologicals, no need of indiscriminate use of antibiotics and therefore putting at risk of Antimicrobial resistance, no need of Growth Factors, Hormones and Hematinics, thereby reducing the cost of production and ultimately increases the profit. Use of these herbs increases the disease resistance in Native chicken and thereby reduces the cost of treatment. Moreover Herbo chicken ensures quality meat and egg products to the consumers which the consumers can take without fear of acquiring Hormonal imbalances or antimicrobial resistance.

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