

Lean Meat Production In Guinea Fowl Through Homeopathic *Aegle Marmelos*, *Chelidonium Majus* And *Boerhaavia Diffusa* Mother Tincture Supplementation

Sneh Lata Gupta¹ and Jyoti Palod²

1. Ph.D Scholar, Division of Poultry Science, CARI, Izatnagar, Bareilly.

2. Professor, Dept. of LPM, CVAS, GBPUAT, Pantnagar

Corresponding author e-mail: drsneha.44@gmail.com

ABSTRACT

An experiment was undertaken on a total one-eighty, guinea fowls (*Numida meleagris*) of day old age, which were randomly divided into four groups [Control, *Bael* (*Aegle marmelos*), *Chelidonium* (*Chelidonium majus*) and *Punarnava* (*Boerhaavia diffusa*)] mother tincture, each group having three replications consisting of fifteen guinea fowls each, for a period of 12 weeks. The respective homeopathic mother tinctures as per the groups were added @ 0.05ml, 0.08ml and 0.1ml per bird in the drinking water at the age of 1-4 weeks, 5-8 weeks and 9-12 weeks respectively, excluding the control groups which were given plain water. At the end of feeding trial on 84th day, two birds from each replicate (6 birds/ treatment) were randomly sacrificed for estimating the carcass composition. Results of the experiment revealed that inclusion of *Bael*, *Chelidonium* and *Punarnava* homeopathic mother tinctures in the drinking water of the guinea fowls significantly increased the crude protein content of drumstick, thigh and breast muscles and decreased the fat content in thigh and breast muscles with maximum effect in *Chelidonium* mother tincture supplemented group of guinea fowls. Hence it is concluded that, these homeopathic mother tincture can be used to produce designer meat in guinea fowls.

Key words: Guinea fowls, Carcass Composition, *Aegle marmelos*, *Boerhaavia diffusa*, *Chelidonium majus*

Guinea fowl (*Numida melleagris*) is one of the important poultry species in low income and poor resourced communities (Saina *et al.*, 2005) due to low input requirements, greater capacity to scavenge for food and high meat quality (Agwunobi and Ekpenyong, 2006). Guinea fowl production for meat is a potentially advantageous enterprise in many parts of the world (Nahashon *et al.*, 2006). The meat of guinea fowl is white, tender and easily digestible like that of chicken and has delicate flavour. The meat is lean and rich in essential fatty acids, taste is similar to meat of other game birds. India is a rich source of traditional medicines; many of them are of plant origin. Such type of plant derivatives could be of significant importance. In order of improve health and to fulfil consumer expectations in relation to food quality, poultry producers commonly used natural feed supplements, mainly herbs (Gardzielewska *et al.*, 2003). The administration of polyherbal liver tonic formulations enhanced nutrient utilization, reducing mortality, increasing livability and

carcass quality (Sharma *et al.*, 2008). As an alternate to herbal extracts, homeopathic mother-tinctures are better option as they are commercially available at low cost. Mother tinctures refer to a simple combination of a plant extract with specific amount of alcohol and their efficacy is in line with traditional herbal preparations. Mother tinctures are quite popular options in human being due to their fast action, easy accepted by the body, especially the *gastrointestinal* system and long term effectiveness. Use of homeopathic mother tinctures in poultry is relatively a new concept, available literature suggests positive influence of them in layers (Ongmoo 2011). Addition of homeopathic mother tinctures has a positive influence on broiler performance and quality traits of meat (Gupta *et al.*, 2014). There is paucity of information on carcass parameters. Therefore, the present study was conducted to determine the effect of certain homeopathic mother tinctures of plant origin on the carcass characteristics in guinea fowls.

METHODOLOGY

An experiment on one-eighty guinea fowls (*Numida meleagris*) from their initial nursing day old age of keets was carried out at Instructional Poultry Farm (IPF), College of Veterinary and Animal Sciences, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar- 263 145 Uttarakhand, India. They were randomly divided into four groups (Control, Bael, Chelidonium and Punarnava mother tincture supplemented group), each group having three replications consisting of fifteen guinea fowls each. All the birds were reared on deep litter system and provided standard diet. The respective homeopathic mother tinctures as per the groups were added @ 0.05ml, 0.08ml and 0.1ml per bird in the drinking water at morning time at the age of 1-4 weeks, 5-8 weeks and 9-12 weeks respectively; excluding the control group birds which were given plain drinking water. At the end of feeding trial on 84th day, two birds from each replicate (6 birds/ treatment) were randomly selected and slaughtered to study the effect of homeopathic mother tinctures of three herbs, namely, Bael (*Aegle marmelos*), Chelidonium (*Chelidonium majus*) and Punarnava (*Boerhaavia diffusa*) on carcass composition of guinea fowls. Prior to slaughter the guinea fowls were off fed for 12 hours. All the observations recorded in the study were subjected to statistical analysis using one way ANOVA and differences between group means were considered significant at $P < 0.05$; as described by *Snedecor and Cochran (1994)*.

RESULTS AND DISCUSSION

Drumstick: The mean values for average drumstick moisture content ranged from 71.72 ± 0.01 to 71.88 ± 0.02 per cent, drumstick crude protein content ranged from 22.18 ± 0.01 to 23.88 ± 0.03 , drumstick crude fat content 2.40 ± 0.00 to 2.44 ± 0.03 per cent and drumstick total ash content were 1.38 ± 0.01 to 1.40 ± 0.00 , per cent as shown in Table 1.

The moisture content, crude fat and total ash content of drumstick revealed non-significant impact of supplementation of Bael, Chelidonium and Punarnava homeopathic mother tinctures. Drumstick crude protein content was significantly ($P < 0.05$) increased in all the homeopathic mother tincture supplemented groups of guinea fowls with maximum (23.88) in T3 and minimum (22.18) in T1.

Table 1. Effect of homeopathic mother tinctures on proximate composition of drumstick meat of guinea fowls (mean \pm SE)

Treat-ments	Drumstick meat composition			
	Moisture	CP*	EE	Total Ash
T1	71.88 \pm 0.02	22.18d \pm 0.01	2.43 \pm 0.01	1.39 \pm 0.01
T2	71.83 \pm 0.14	22.59c \pm 0.04	2.42 \pm 0.02	1.40 \pm 0.00
T3	71.72 \pm 0.01	23.88a \pm 0.03	2.40 \pm 0.00	1.38 \pm 0.01
T4	71.75 \pm 0.20	23.15b \pm 0.02	2.44 \pm 0.03	1.38 \pm 0.01

Values with different superscripts column wise differ significantly ($P < 0.05$)

Thigh: The mean values for average thigh moisture content were 72.13 ± 0.08 , 72.58 ± 0.28 , 72.03 ± 0.03 and 72.49 ± 0.16 per cent, thigh crude protein content were 21.97 ± 0.02 , 22.34 ± 0.04 , 23.61 ± 0.02 and 22.20 ± 0.03 per cent, thigh crude fat content were 2.91 ± 0.02 , 2.61 ± 0.01 , 2.51 ± 0.00 and 2.64 ± 0.02 per cent and thigh total ash content were 1.45 ± 0.00 , 1.44 ± 0.00 , 1.43 ± 0.01 and 1.44 ± 0.00 per cent for treatment groups T1 to T4, respectively as shown in Table 2.

Table 2. Effect of homeopathic mother tinctures on thigh meat composition of guinea fowls (mean \pm SE)

Treat-ments	Thigh meat composition			
	Moisture	CP*	EE	Total Ash
T1	72.13 \pm 0.08	21.97d \pm 0.02	2.91a \pm 0.02	1.45 \pm 0.00
T2	72.58 \pm 0.28	22.34b \pm 0.04	2.61b \pm 0.01	1.44 \pm 0.00
T3	72.03 \pm 0.03	23.61a \pm 0.02	2.51c \pm 0.00	1.43 \pm 0.01
T4	72.49 \pm 0.16	22.20c \pm 0.03	2.64b \pm 0.02	1.44 \pm 0.00

Values with different superscripts column wise differ significantly ($P < 0.05$)

The results on thigh meat composition revealed that moisture and total ash content did not reveal any significant ($P < 0.05$) impact due to the supplementation of homeopathic mother tinctures. Crude protein content was significantly ($P < 0.05$) increased in all the supplemented groups with maximum (23.61) in chelidonium mother tincture supplemented group while crude fat content was significantly ($P < 0.05$) decreased in all the supplemented groups with maximum (2.91) in control and minimum (2.51) in chelidonium supplemented group of guinea fowls. No significant difference was observed in between crude fat content of thigh of bael and punarnava supplemented groups of guinea fowls.

Breast : The mean values for average breast moisture content were 72.02 ± 0.01 , 72.21 ± 0.10 , 72.04 ± 0.01 and 72.07 ± 0.05 per cent, breast crude protein content were 22.77 ± 0.03 , 23.38 ± 0.02 , 24.42 ± 0.15 and 23.58 ± 0.06 per cent, breast crude fat content were 2.25 ± 0.00 ,

2.21±0.00, 2.06±0.01 and 2.18±0.00 per cent and breast total ash content were 1.49±0.01, 1.46±0.01, 1.44±0.00 and 1.46±0.02 per cent for treatment groups T1 to T4, respectively as shown in Table 3.

Table 3. Effect of homeopathic mother tinctures on proximate composition of breast meat of guinea fowls (mean ± SE)

Treat-ments	Breast meat composition			
	Moisture	CP*	EE	Total Ash
T1	72.02±0.01	22.77c±0.03	2.25a±0.00	1.49±0.01
T2	72.21±0.10	23.38b±0.02	2.21b±0.00	1.46±0.01
T3	72.04±0.01	24.42a±0.15	2.06d±0.01	1.44±0.00
T4	72.07±0.05	23.58b±0.06	2.18c±0.00	1.46±0.02

Values with different superscripts column wise differ significantly (P<0.05)

The results recorded in this study revealed that moisture and total ash content of breast revealed non-significant impact due to the supplementation of homeopathic mother tinctures. Crude protein content was significantly (P<0.05) increased in all the treated groups with maximum (24.42) in Chelidonium supplemented group. While in between Bael and Punarnava supplemented groups it did not differ significantly. Crude fat content was significantly (P<0.05) decreased in all the supplemented groups with minimum (2.06) in Chelidonium supplemented group of guinea fowls.

The results obtained in present experiment get support of the reports of Mellor (2001) who found the

nitrogen-saving effects of Sanguinarine. As sanguinarine (an alkaloid of Chelidonium) reduce the loss of tryptophan and phenylalanine as toxic biogenic amines like indole and skatole and inhibits amino acid decarboxylase due to which more aromatic amino acids become available resulting in better protein balance and thus higher lean meat percentage in the carcass. Increased protein content of muscles may be due to increase in net protein retention in Chelidonium supplemented groups of guinea fowls while reduction in crude fat may be attributed to reduction of lipogenesis or stimulation of lipolysis which is an important finding of present investigation for lean meat production.

CONCLUSION

From these results it is concluded that inclusion of Bael, Chelidonium and Punarnava homeopathic mother tinctures in the drinking water of the guinea fowls significantly increased the crude protein content of drumstick, thigh and breast muscles while decreased the fat content of thigh and breast muscles with maximum response in Chelidonium supplemented group. Hence it is concluded that, the use of homeopathic mother tinctures of Bael, Chelidonium and Punarnava cause healthy improvement in carcass composition of guinea fowls. These homeopathic mother tinctures can be incorporated in water as supplement to get lean meat.

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