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Effect Of Using Some Phytogetic And Probiotic In Diet On Productive Performance And Immune Response Of Local Laying Hens

By

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CONTENTS

Subject	Page
1. INTRODUCTION	1
2. REVIEW OF LITERATURE.	4
2.1. Characterizations of probiotics and phytochemicals.	4
2.1.1. <i>Lactobacillus acidophilus</i> used as probiotics.	4
2.1.2. Chicory (<i>Cichorium intybus</i>) used as phytochemical.	5
2.1.2.1. Chemical composition of chicory.	6
2.2. Effect of dietary probiotic and phytochemical (chicory) levels on productive performance.	8
2.2.1. Live Body weight	8
2.2.2. Feed intake.	11
2.2.3. Feed conversion ratio.	14
2.3. Effect of dietary probiotic and phytochemical (chicory) levels on traits of egg production.	17
2.3.1. Egg production.	17
2.3.2. Egg weight.	20
2.3.3 Egg mass	23
2.4. Effect of dietary probiotic and phytochemical (chicory) levels on egg quality traits:	25
2.4.1. Weights of egg components:	25

Subject	Page
2.4.1.1. Yolk weight.	25
2.4.1.2. Albumen weight	27
2.4.1.3. Shell weight	28
2.4.2. Egg shape index.	30
2.4.3. Yolk index	31
2.4.4. Haugh unit	32
2.4.5. Shell thickness	34
2.5. Effect of dietary probiotic and phytogetic (chicory) levels on incubation traits.	37
2.5.1. Fertility and hatchability.	37
2.6. Effect of dietary probiotic and phytogetic (chicory) levels on carcass traits.	39
2.7. Effect of dietary probiotic and phytogetic (chicory) levels on blood parameters.	42
2.7.1. Plasma total protein, albumin and globulin.	42
2.7.2 Plasma cholesterol and total lipids	44
2.7.3. Plasma aspartate aminotransferase (AST) and alanine aminotransferase (ALT) activities:	47
2.7.4. Humoral immune response:	49
2.7.4.1. Antibody titers of Newcastle (ND) and Influenza.	49
2.8. Effect of dietary probiotic and phytogetic (chicory) levels on economic efficiency.	51

Subject	Page
3. MATERIALS AND METHODS	53
3.1. Experimental birds and management:	53
3.2. Grouping and experimental treatments applied:	55
3.3. Preparations and composition of chicory and probiotic.	55
3.4. Traits estimated and data collection:	57
3.4.1. Growth performance traits.	57
3.4.1.1. Average live body weight.	57
3.4.1.2. Feed intake and feed conversion ratio:	57
3.4.2.1. Rate of egg production.	57
3.4.2.2. Egg weight:	58
3.4.2.3. Egg mass:	58
3.4.3. Traits of egg quality:	58
3.4.3.1. Relative weights of egg components.	58
3.4.3.2. Egg shape index:	58
3.4.3.3. Egg yolk index:	58
3.4.3.4. Haugh units:	59
3.4.3.5. Egg shell thickness:	59
3.4.4. Fertility and hatchability:	59
3.4.5 Slaughter and carcass traits:	60
3.4.6. Blood analysis:	60

3.4.6.1. Plasma protein fractions:	61
3.4.6.1.1. Plasma total protein:	61
3.4.6.1.2. Plasma albumin:	61
3.4.6.1.3. Plasma globulin and A/G ratio:	61
3.4.6.2. Plasma lipids:	62
3.4.6.2.1. Plasma total cholesterol:	62
3.4.6.2.2. Plasma total lipids:	62
3.4.6.3. Liver function:	62
3.4.6.3.1. Plasma asparatate aminotransferase (AST) and alanine aminotransferase (ALT):	62
3.4.6.4. Humoral immune response:	63
3.4.7. Economical Efficiency:	63
3.5. Statistical Analysis:	63
4. RESULTS AND DISCUSSION	65
4.1. Effect of probiotic and phytogenic (chicory) levels on productive performance of Inshas local hens.	65
4.1.1. Live body weight.	65
4.1.2. Feed intake.	68
4.1.3. Feed conversion ratio.	70
4.2. Effect of dietary probiotic and phytogenic (chicory) levels on egg production traits of Inshas local hens:	73
4.2.1. Egg production rate.	73

4.2.2. Egg weight.	75
4.2.3. Egg mass.	78
4.3. Effect of dietary probiotic and phytogetic (chicory) levels on egg quality traits:	81
4.3.1. Relative weights of egg components:	81
4.3.1.1 Egg yolk percentage	81
4.3.1.2 Egg albumen percentage.	84
4.13.3. Egg shell percentage.	87
4.3.2. Egg shape index	90
4.3.3. Egg yolk index.	93
4.3.4. Haugh units	97
4.3.5. Egg shell thickness	100
4.4. Effect of dietary probiotic and Phytogetic (chicory) levels on incubation traits of Inshas local hens:	103
4.4.1. Fertility and hatchability percentages:	103
4.4.1.1. Fertility percentage:	103
4.4.1.2. Hatchability	105
4.5. Effect of dietary probiotic and phytogetic (chicory) levels on slaughter traits of Inshas laying hens.	108
4.6. Effect of dietary probiotic and phytogetic (chicory) levels on blood parameters of Inshas laying hens.	113
4.6.1 Plasma total proteins, albumin (A), globulin (G), and A/G ratio.	113

4.6.2. Plasma total lipids and cholesterol:	115
4.6.3. Effect of dietary probiotic and phytogetic (chicory) levels on liver function of Inshas laying hens.	118
4.6.3.1.1. Plasma asparatate aminotransferase (AST) and alanine aminotransferase (ALT) activities:	118
4.6.4. Humoral immune response:	121
4.6.4.1. Antibody titers of Newcastle (ND) and Influenza (H9N2).	121
5. SUMMARY AND CONCLUSION	126
6. REFERENCES	130
7. ARABIC SUMMRY	-

LIST OF TABLES

No. of Table	Title	No. of Page
(1)	Feed ingredients and chemical analysis of the basal laying ration.	54
(2)	Chemical analysis of chicory on dry matter basis.	56
(3)	Least square means and standard error ($\bar{X} \pm$ S.E.) for body weight of birds of different experimental groups as affected by dietary supplementation.	66
(4)	Analysis of variance for factors affecting body weight	67
(5)	Least square means and standard error ($\bar{X} \pm$ S.E.) for feed intake of birds of different experimental groups as affected by dietary supplementation.	69
(6)	Analysis of variance for factors affecting feed intake.	70
(7)	Least square means and standard error ($\bar{X} \pm$ S.E.) for feed conversion of birds of different experimental groups as affected by dietary supplementation.	71

No. of Table	Title	No. of Page
(8)	Analysis of variance for factors affecting feed conversion.	72
(9)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg production rate of birds of different experimental groups as affected by dietary supplementation.	74
(10)	Analysis of variance for factors affecting egg production rate.	75
(11)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg weight of birds of different experimental groups as affected by dietary supplementation.	77
(12)	Analysis of variance for factors affecting egg weight.	78
(13)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg mass of birds of different experimental groups as affected by dietary supplementation.	79
(14)	Analysis of variance for factors affecting egg mass.	80
(15)	Least square means and standard error ($\bar{X} \pm$ S.E.) for yolk percentage (%) of birds of different experimental groups as affected by dietary supplementation.	83

No. of Table	Title	No. of Page
(16)	Analysis of variance for factors affecting yolk percentage (%).	84
(17)	Least square means and standard error ($\bar{X} \pm$ S.E.) for albumen percentage (%) of birds of different experimental groups as affected by dietary supplementation.	85
(18)	Analysis of variance for factors affecting albumen percentage (%).	86
(19)	Least square means and standard error ($\bar{X} \pm$ S.E.) for shell percentage (%) of birds of different experimental groups as affected by dietary supplementation.	89
(20)	Analysis of variance for factors affecting shell percentage (%).	90
(21)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg shape index of birds of different experimental groups as affected by dietary supplementation.	92
(22)	Analysis of variance for factors affecting egg shape index.	93
(23)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg yolk index of birds of different experimental groups as affected by dietary supplementation.	95

No. of Table	Title	No. of Page
(24)	Analysis of variance for factors affecting egg yolk index.	96
(25)	Least square means and standard error ($\bar{X} \pm$ S.E.) for Haugh units of birds of different experimental groups as affected by dietary supplementation.	98
(26)	Analysis of variance for factors affecting Haugh units.	99
(27)	Least square means and standard error ($\bar{X} \pm$ S.E.) for egg shell thickness of birds of different experimental groups as affected by dietary supplementation.	101
(28)	Analysis of variance for factors affecting egg shell thickness.	102
(29)	Least square means and standard error ($\bar{X} \pm$ S.E.) for fertility percentage of birds of different experimental groups as affected by dietary supplementation.	104
(30)	Analysis of variance for factors affecting fertility percentage.	105
(31)	Least square means and standard error ($\bar{X} \pm$ S.E.) for hatchability percentage (%) of birds of different experimental groups as affected by dietary supplementation.	107

No. of Table	Title	No. of Page
(32)	Analysis of variance for factors affecting hatchability percentage (%).	108
(33)	Least square means and standard error ($\bar{X} \pm$ S.E.) for carcass traits of birds of different experimental groups as affected by dietary supplementation.	111
(34)	Analysis of variance for factors affecting carcass traits.	112
(35)	Least square means and standard error ($\bar{X} \pm$ S.E.) plasma for total protein, albumin (A), globulin (G) and A/G ratio of birds of different experimental groups as affected by dietary supplementation.	114
(36)	Analysis of variance for factors affecting plasma total protein, albumin (A), globulin (G) and A/G ratio.	114
(37)	Least square means and standard error ($\bar{X} \pm$ S.E.) for plasma total lipids and cholesterol of birds of different experimental groups as affected by dietary supplementation.	117
(38)	Analysis of variance for factors affecting total lipids and cholesterol.	118

No. of Table	Title	No. of Page
(39)	Least square means and standard error ($\bar{X} \pm$ S.E.) for liver function plasma aspartate aminotransferase (AST) and alanine aminotransferase (ALT) of birds of different experimental groups as affected by dietary supplementation.	120
(40)	Analysis of variance for plasma aspartate aminotransferase (AST) and alanine aminotransferase (ALT).	121
(41)	Least square means and standard error ($\bar{X} \pm$ S.E.) for the antibody titer of Newcastle disease virus (NDV) and A vain influenza (H9N2) of birds of different experimental groups as affected by dietary supplementation.	122
(42)	Analysis of variance for H9N2 and NDV.	123
(43)	Economical efficiency of different experimental groups as affected by studied factors.	125

5. SUMMARY AND CONCLUSION

The present study was carried out at Inshas poultry breeding Research Station, Animal Production Research Institute, Agriculture Research Center, Giza, Egypt, during the period from 8 September 2017 to 8 March 2018. It was aimed to evaluate the effect of different dietary levels of probiotics (*Pedicoccus acidilacti*), phytogenics (chicory) and their mixture as feed additives on productive performance and immune response of Inshas local strain hens for egg production.

A total number of 720 laying hens and 72 cocks of Inshas local strain, 26 weeks old, were randomly chosen and divided into 12 groups (60 hens and 6 cocks each). Hens of each group were nearly similar in averages body weight. Each group was divided into three replicates, each of 20 and 2 cocks. Birds were kept under similar, standard hygienic and environmental conditions. The photoperiod during the experimental period was fixed at 16 hour daily. All birds were housed in floor laying houses 3x2 meter size.

A (3x4) factorial experimental design with three levels of probiotics (0, 0.5 and 1.0 g/kg diet) and four levels of phytogenics (0, 5, 10 and 20 g/kg diet) and their interaction were tested for 24 weeks.

Birds of each experimental group were individually weighed to the nearest gram at the beginning of the experiment, and then at every eight weeks intervals up to the end of the experimental period (50 weeks of age), feed intake, feed conversion ratio, egg production traits (egg production rate, egg weight and egg mass), egg quality traits, fertility, hatchability and carcass measurements were estimated or calculated.

Blood plasma constituents including plasma protein fractions, total lipids, cholesterol, aspartate aminotransferase (AST), alanine aminotransferase (ALT) and antibody titer against Newcastle disease virus (NDV) and avian influenza (H9N2) were determined at the end of the experimental period.

Result obtained could be summarized as follows:

- Highly significant variation ($p \leq 0.01$) are found in averages of feed conversion ratio (FCR), egg production rate (EPR) and egg mass at the most periods of the experiment and all over the experimental period due to all treatments applied,
- The higher body weight was found in birds fed diet with 1.0 g probiotic, 20 g chicory / Kg diet and the interaction between them compared with control group and different treatments applied,
- The best feed conversion ratio (4.67, 4.64 and 4.03 g feed/g egg), egg production rate (53.35, 53.29 and 62.16 % hen/day) and egg mass (26.19, 26.22 and 30.10 g/hen/day) were found in birds fed diets supplemented with 1.0 g probiotic, 5 g chicory / kg diet and the interaction between them, respectively.
- Interaction between probiotic and chicory levels of dietary supplementation had a highly significant effect ($P \leq 0.01$) on relative weights of egg yolk, albumen and shell. The higher value of these traits was found in the interactions between (1.0 g probiotic x 5 g chicory), (0 g probiotic x 20 g chicory) and (1.0 g probiotic x 20 g chicory/Kg diet), respectively.
- Dietary probiotic levels had highly significant effects ($p \leq 0.01$) on the average egg shape and egg yolk index during the period from 26-34 weeks and all over the experimental period. While, hens fed diet with (0 g probiotic x 10 g chicory and 1.0 g probiotic x 0

g chicory/Kg diet) showed the highest averages of egg yolk index and Haugh units.

- Shell thickness and egg yolk index were significantly ($P \leq 0.05$) affected by dietary chicory levels during the most periods of estimation. The highest egg shell thickness was observed in control group, then by hens fed diet with chicory at a level of 10 g/Kg diet compared with other chicory levels applied.
- Hens fed diet with 20g chicory/ Kg diet significantly increased fertility and hatchability percentage compared with different treatments applied. Also, hatchability percentage only significantly affected due to probiotic treatments. However, birds fed diet with (1 g probiotic x 20 g chicory /kg diet) showed the higher averages of fertility and hatchability percentage compared with different interaction.
- Highly significant variations ($P \leq 0.01$) were found in absolute and proportional weights of giblets and abdominal fat due to the level of dietary chicory supplementation only.
- Highly significant variations were found in absolute and the relative weights of giblets and significant effects were found in relative weight of carcass and total edible parts due to the interaction between chicory and probiotic.
- The higher absolute and relative weights of carcass and total edible parts were observed in hens fed diets with chicory at levels of 20 g/Kg diet compared with the control group and different chicory levels applied.
- Plasma total protein and albumin were significantly improved ($P \leq 0.05$) by dietary probiotic levels. The higher averages of plasma total protein and albumin were observed with hens fed

diet with probiotic at a level of 1.0 and 0.5 g/Kg diet, respectively when compared with the control group.

- Dietary probiotic and chicory levels significantly decreased plasma cholesterol level. Feeding bird's diet with 1 g probiotic or 20 g chicory / Kg diet or interaction between the same levels showed the lowest averages of plasma cholesterol and total lipids compared with different treatments applied.
- Dietary probiotic and chicory levels showed significant effect on plasma AST and ALT levels.
- The lower plasma AST and ALT averages were observed in hens fed diet with 1.0 g probiotic /kg diet when compared with control groups. However, hens fed diet with chicory at a level of 10 and 20 g/kg diet showed the lower averages plasma AST and ALT level, respectively.
- Significant improvements ($p \leq 0.05$) in immune response toward antibody titers of Newcastle (ND) and Influenza (H9N2) were found due to dietary probiotic only. The higher antibody titer of H9N2 and NDV were observed in hens fed diets supplemented with probiotic at a level of 1.0 and 0.5 g/kg diet, respectively compared with control group.

Conclusion:

It could be concluded that feeding Inshas laying hens with supplemented diets with 1.0 g probiotic or 5 g chicory / Kg diet or these interactions (1.0 g probiotic X 5 g chicory), (0.5 g probiotic X 20 g chicory) and (1.0 g probiotic X 10 g chicory / kg diet), respectively to get higher productive performance, immune response and economical efficiency and is begin recommended from the economic point of view.