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The Effect of Addition in Drinking Water of *Agnihotra* Ash on Growth Rate and Meat Quality of Broiler Chicken

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ABSTRACT

Agnihotra ash can be considered as waste obtained after conducting Agnihotra ritual, an ancient ritual of Hindu religion, and it is believed that it beneficial for (1) health, (2) improvement of agricultural production, including livestock, and (3) spiritually balance of the atmosphere or nature. In regard to its benefits, the present research work was aimed to study the effect of addition in drinking water of Agnihotra ash on productivity of broiler chickens. A completely randomized design was employed, comprising of four (4) treatments, namely: Group A or control with no addition of ash in drinking water, Group B with addition of 1 g of ash/liter of drinking water, Group C with addition of 2 g of ash/l drinking water and Group D with addition of 3 g of Agnihotra ash/ liter of drinking water; the treatments were equal to 0, 0.1, 0.2, and 0.3% of Agnihotra ash/kg of water, respectively. Each treatment consisted of 4 replications. Feed and drinking water were offered ad libitum. The variables recorded and analyzed include growth rate, physical qualities of the carcass, and physiological status, i.e. hematology, clinical chemistry of blood, cholesterol. Statistical analysis of the data was performed following Analysis of Variance (ANOVA). Finally, from financial point of view, impact on income of the chicken farmers when they keep their chickens under such treatments was also assessed.

Thus, the current study was intended to find out the spiritual power of Agnihotra ash which is filled with Vedic mantra that may have an effect on broiler production. From those all variables analyzed, no significant difference was noted. These could mean that although the treatments did not result in a significant response, from spiritual point of view, the addition of Agnihotra ash in drinking water tend to have benefit in terms of increasing income of chicken farmers.

Keywords: *Agnihotra ash, broiler, growth rate, carcass, physiological status, financial analysis*

INTRODUCTION

It should be understood that there always by-products or wastes that yield in the process of exploitation of natural resources. Moreover, we should consider that such wastes should be recycled or reused and not merely to be disposed. In agricultural production system, for example, such an attempt has become subject of investigation by research workers. For instance, waste obtained from cacao plantation – cacao pod – has been reported by Mariani and Suryani (2004) can be used as duck feed. Other findings on utilization of wastes include those obtained from home production of *tempe* using soya bean for layer feed (Mariani and

Bidura, 2003), garlic straw for duck ration (Bidura and Mahardika, 2005), and wood chainsaw dust for broiler feed (Sudiastra *et al*., 2002). As mentioned by Yupardhi (2001), consumed feed has an effect on blood components that are formed which, in turn, may affect animal productivity, particularly growth rate and the normal function of various organs.

Agnihotra ash is considered as waste obtained after conducting ancient ritual of Hindu religion. *Agnihiotra* is a holly fire ritual that has been abandoned for centuries but is practiced recently in Bali. Jendra dan Titib (1999) stated that when *Agnihotra* ritual is performed accordingly and with full appreciation, the yielded waste or ash will improve production of agricultural sector, including livestock. It has been stated that *Agnihotra* ash is spiritually filled with sacred Hindu *mantra* (Mantra, 1989). Moreover, according to Ganesan (2002), some researchers from Germany, Russia, Poland, and other countries noted that *Agnihotra* ritual and its waste product is beneficial due to its effect on: (1) health status, (2) improving soil fertility, and (3) spiritual balance of atmosphere or the nature.

In regard to its effect on improving soil fertility, farmers in Peru and South America have applied *Agnihotra* ash as fertilizer for crops; their productivity many folds higher than that receive no *Agnihotra* ash (Ganesan, 2002). In relation to its "*mantra* content" of the *Agnihotra* ash, Patanjali Muni (in Wibawa, 2007) stated that incorrect chanting of *mantra* may have a bad consequence; it may not give optimum benefits as mentioned above, but also may result in negative impact on people who chanting the *mantra* itself.

Yupardhi (2005, unpublished data) recorded that *Agnihotra* ash contains some minerals as follows: phosphate (P): 12629.95 mg/kg of ash, calcium (Ca): 10.017 mg/kg, zinc (Zn): 82.212 mg/kg, and iron (Fe): 16.225 mg/kg. Thus, from application point of view, *Agnihotra* ash not just may have effect on soil structure, but may also provide some minerals to plants or to animals that receive the ash through their feed and/or drinking water. Indeed those minerals are the ones needed by animals kept in pens or cages for their growth and productivity (Hall, 1977).

Thus, the present research work reported here was conducted in order to find out: (1) the effect of supplementation of *Agnihotra* ash on broiler chickens assessed from their growth, physical carcass quality and physiological status and (2) implication of supplementation of *Agnihotra* ash on income of farmers rearing broiler chickens, upon the application of the results at the level of community.

MATERIALS AND METHODS

The current study was conducted for 5 weeks from August 6 – September 10, 2016. Prior to the actual course of experiment, a four days preliminary period was carried out in order to deplete egg yolk content as source of energy so that the animals were in homogeny condition (Zalenka, 1968). A number of 80 chicks (DOC), CP 707 broiler, were kept in 16 battery colony cages; 5 birds in each cage.

A completely randomized design was employed with 4 treatments of addition of *Agnihotra* ash and 4 replications in each treatment. Moreover, each replication consisted of 5 birds, so that the total experimental animal used was 80 birds as mentioned above. Treatment A was the control which received no *Agnihotra* ash; treatment B received 1 g of ash/l of water; treatment C received 2 g/l, and treatment D received 3 g/l; the doses were equal to 0, 0.1, 0.2,

and 0.3% of *Agnihotra* ash/l of water, respectively. They were fed with commercial ration Charoen Pokphand 511; the feed and drinking water were provided *ad libitum*. At the end of the experiment, 20 % of the animal for each treatment were slaughtered; blood samples were obtained and carcass dissection was done according to USDA (1977).

Data collection included body weight and body weight gain, feed consumption, water consumption, feed conversion ratio (FCR), weight of carcass and its components, physical carcass quality, and physiological status (hematology and clinical chemistry of the blood, cholesterol). The data was then statistically analyzed following Analysis of Variance (ANOVA) and when significant different was noted, Duncan's Multiple Range Test (Steel and Torrie, 1989) was employed.

RESULTS AND DISCUSSION

At the end of experiment (Week-5), all variables recorded – body weight and body weight gain, feed consumption, water consumption, FCR, carcass weight (%) and weight of its components, and the physiological status – did not significantly differ ($P > 0.05$) between the treatments (see Tables 1, 2, and 3). The only variable that showed a significant different ($P < 0.05$) was for the blood creatinin level (Table 3); the lowest concentration was noted for Treatment D and differed significantly when compared to that for Treatment A and B, but not with Treatment C. It has been stated that the low level of blood creatinin indicates the healthy condition of the kidney. As mentioned in Ganong (1983), the relative constant excretion of creatinin from day to day is quite important for the proper rate of metabolism in the body. On the other hand, quick accumulation of creatinin will occur when the kidney undergo serious damage in its tissues which in turn, may affect the overall health status. In regard to the current experimental animals, they were almost in normal healthy condition throughout the actual period of experiment. During the experiment, there were only 2 animals (2.5%) died due to high ambient temperature in one day and night for 32^{o}C and 30^{o}C but, the rest were still alive (tolerant to those conditions). In general, it was not far from range of chicken death rate for about 2 % (Professor Suparta, 2016, pers. com., the agent of CP 707 broiler chicks at Denpasar). As stated by Bone (1982), when no severe shock or stress is observed, it could mean that no kidney damage has occurred. That was the case for chickens in Treatment A and B in the current study.

As shown in Table 1, there was no significant difference ($P > 0.05$) noted for body weight and body weight gain as well as on feed and water consumption and on FCR between treatments. Thus, it could mean that addition of *Agnihotra* ash from 1 - 3 g/l of water (equal to 0.1 – 0.3% per kg of water) did not give response to broiler chickens, though as stated by Yupardhi (2015, unpublished data) *Agnihotra* ash contain important minerals: P (12629.95 mg/kg ash), Ca (10.017 mg/kg), and Zn (82.212 mg/kg) that are needed for proper growth. It has been said by Hill (1977) and other scientist (Scott *et al.*, 1982) that those minerals are needed for chickens. The increasing of mineral delivery that originally from *Agnihotra* ash up to 3 g/l water could increase feed consumption, weight gain and efficiency of feed utility. This causes increased palatability and metabolism in animal body which was showed by the lower value of FCR. Those phenomena were supported by Hall (1977) and Scott *et al*. (1982) that feed palatability affects metabolism in the body.

The present results could be related to the low doses of *Agnihotra* ash addition for the broiler chickens. Although from statistical analysis point of view no significant difference was noted, the treatments revealed some tendencies towards improvement of the parameters.

Table 1 The effect of addition of *Agnihotra* ash in drinking water on body weight and body weight gain, feed and water consumption, and FCR of broiler chickens during the experiment

Variable	Treatment				SEM
	A	B	C	D	
Initial live body weight (g/head)	51.55[a]	50.76[a]	52.16[a]	52.50[a]	0.87
At end of the experiment:					
Final body weight (g/head)	1787.37[a]	1844.25[a]	1934.52[a]	1948.72[a]	65.76
Weight gain (g/head)	1735.92[a]	1786.29[a]	1882.18[a]	1894.82[a]	66.09
Feed consumption (g/head)	3696.00[a]	3741.25[a]	3864.56[a]	3727.08[a]	114.41
Water consumption (ml/head)	6698.86[a]	6880.70[a]	7345.45[a]	6981.66[a]	353.02
FCR	2.13[a]	2,03[a]	2.01[a]	1.91[a]	0.09

Value with the same superscript in the same rows means no significant difference (P > 0.05)

Table 2 The effect of addition of *Agnihotra* ash in drinking water on carcass of broiler chickens during the experiment

Variable	Treatment				SEM
	A	B	C	D	
Carcass:					
Slaughter weight (g/head)	1691.82[a]	1771.02[a]	1981.30[a]	1881.92[a]	93.71
Carcass weight (%)	74.05[a]	74.98[a]	74.93[a]	73.11[a]	1.70
Carcass Physical Condition: Bone (%)	31.91[a]	37.31[a]	33.56[a]	36.69[a]	2.67
Meat (%)	45.70[a]	41.34[a]	37.21[a]	45.97[a]	3.66
Subcutaneous Fat (%)	1.55[a]	0.88[a]	8.67[a]	8,02[a]	1.97
Skin (%)	7.82[a]	7.16[a]	8.69[a]	8.02[a]	1.97

Visceral: Liver (g)	46.48a	41.34a	44.57a	50.28a	3.23
Kidney (g)	3.28[a]	3.82[a]	5.31[a]	4.77[a]	0.55
Carcass Physical Quality:					
Cooking loss (%)	67.72[a]	65.86[a]	66.27a	71.34a	2.48
Water holding Capacity (%)	42.55[a]	32.14[a]	34.80a	33.06a	4.71
Meat pH (%)	5.75[a]	5.80[a]	5.82[a]	5.75[a]	0.06
Meat water content (%)	31.25[a]	25.50[a]	25.00[a]	26.75[a]	3.10

Value with the same superscript in the same rows means no significant difference (P > 0.05)

Likewise, its effect on carcass weight and weight of its components and on carcass physical quality (Table 2) was not significant; no significant difference (P > 0.05) was noted between all parameters recorded and analyzed.

Some data on the physiological status of the experimental animals after receiving *Agnihotra* ash through their drinking water were recorded and statistically analyzed. The data are presented in Table 3. Statistical analysis also showed that there was no significant difference (P > 0.05) among the parameters recorded.

Table 3 The effect of addition of *Agnihotra* ash in drinking water on physiological status of broiler chickens during the experiment

Variable	Treatment				SEM
	A	B	C	D	
Clinical Blood Chemistry:					
Serum glutamic oxaloacetate transami-nase (SGOT) (U/L)	321.50[a]	258.75[a]	252.25[a]	267.25[a]	21.91
Serum glutamic piruvat-transaminase (SGPT) (U/L)	43,50[a]	49.50[a]	46.25[a]	43.25[a]	11.38
Ureum (mg/dl)	8.07[a]	7.30[a]	6.20[a]	8.80[a]	9.80
Creatinin (mg/dl)	0.67[a]	0,62[ab]	0.60[bc]	0.55[c]	0.23
Cholesterol (mg/dl)	131.00[a]	121.00[a]	108.00[a]	123,00[a]	12.72
Glucose (mg/dl)	267.75[a]	280.75[a]	266.60[a]	271.00[a]	12.60

Hematology:

Leucocyte (10^3/uL)	222.823[a]	209.737[a]	215.720[a]	188.940[a]	53.043
Erythrocyte (10^6/uL)	1.767[a]	1.145[a]	1.180[a]	1.401[a]	0.622
Hemoglobin (Hb) (g/dl)	7.00[a]	5.20[a]	6.75[a]	6.00[a]	1.37
Platelet (10^3/uL)	3.000[a]	0.250[a]	1.500[a]	0.750[a]	71.443
Blood precipitation rate (mm/h)	3.00[a]	1.75[a]	4.25[a]	2.00[a]	0.70

Value with the same superscript in the same rows means no significant difference ($P > 0.05$)

Thus, based on the above statistical analysis of the data, the present results could be related to the low doses of *Agnihotra* ash that was given to the broiler chickens. Although no significant difference was noted, the treatments revealed some tendencies towards improvement on parameters evaluated, particularly when the feed conversion ratio (FCR) was taken into account. In relation to FCR, Treatment D (received 0.3% of ash) has the lowest and the best FCR compared to the other 3 treatments.

In regard to the effect of *Agnihotra* ash that was given *via* drinking water to the broiler chickens in the present study, the results can also be discussed from spiritual aspect point of view. As we observed the experimental animals were in good health status and it may be related to the spiritual power of sacred Hindu *mantra* contained in the ash. Indeed there have been some reports from Western countries, i.e. Peru and other South American countries, concerning the spiritual power of *Agnihotra* ash. The reports mentioned that during practical application of *Agnihotra* ash, some improvement in agricultural productivity and in health status of people were noted (Ganesan, 2002). The spiritual power of sacred *mantra* was recently discussed by a Hindu scientist, Donder (2014). He mentioned that chanting of *mantra*, which according to Quantum Physics theory may results in superposition of various other waves to yield average frequency that in turn may lead to equilibrium between the micro-cosmos and the macro-cosmos. According to Capra (1975), the universe (the macro-cosmos) consists of live materials so that such concept is related to the relativism aspect that point out absolute boundaries and with consistently consider the development of sciences that come from India and Ancient China that emphasize the belief in the Divinity of God which could overcome all problems faced by human being and all other living creatures. Moreover, this scientist have developed his ideas in more realistic way in which he combine Western science with East mysticism and use his intuitive more than the rational knowledge.

Finally, upon the hypothetical application of the present results at the level of community, which in this case chicken farmers, Table 4 showed analysis on income that may be earned by farmers, calculated based on 20 chickens reared, and on return-cost ratio (R/C).

Table 4 Implication of addition of *Agnihotra* ash in drinking water of broiler chickens on income of chicken farmers and return-cost ratio (R/C), upon the hypothetical application of the results at the level of community

Variable	Treatment				SEM
	A	B	C	D	
Income of farmers (Rp/20 birds)	2.536.90	7.302,50	28.839,13	58.776,10	-
R/C (Return Cost Ratio)	0.99	1.01	1.04	1.09	-

Thus, although statistical analysis showed no significant difference among all variables assessed, analysis from economic point of view showed possible positive effect of the treatments. As mentioned earlier, FCR of chickens in Treatment D was the lowest; feed required to yield meat was less compared to the other treatments. Based on the FCR, upon the hypothetical application of the results, Treatment D will result in the highest income for chicken farmers. When calculation is made based on the price of Rp. 19.000 per kg of live body weight, Treatment D will lead to income of Rp. 58.776,10/20 birds while Treatment A results in loss of Rp. 2.536,90/20 birds.

Moreover, when the return-cost ratio (R/C) – income divided by cost or expenditure - is considered, value of less than 1 means that the business suffers from some losses and higher than 1 means that some benefit is gained; value of equals to 1 means no loss or gain. Thus, Treatment A has R/C value less than 1 whereas the 3 other treatments have R/C value more than 1.

CONCLUSION AND SUGGESTION

Based on the results discussed above, it can be concluded that addition of *Agnihotra* ash up to 3 g/l of water did not result in significant response to growth of broiler chickens. However, from spiritual point of view, the sacred *mantra* that exists in the ash may have positive effect on the animals. Moreover, upon the hypothetical application of the results at the level of chicken farmers, it was calculated that addition of *Agnihotra* ash may lead to higher income earned by chicken farmers as compared to that without ash addition. Furthermore, such a conclusion is further supported by analysis on the return-cost ratio (R/C) showing values that higher than 1 for treatment with various doses of *Agnihotra* ash.

Since there was a tendency of positive effect of addition of *Agnihotra* ash to broiler chickens that can be noted in the current study, it may be worthwhile to run further experiment on addition of *Agnihotra* ash on broiler chickens with special concern on higher doses and method of ash addition and also with higher number of experimental animals involved.

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REFERENCES

i. Bidura, I G. N. G. dan Mahardika, I G.. 2005. Penggunaan Tepung Jerami bawang Putih (Allium sativum) dalam Ransum Terhadap Bobot dan Komposisi Fisik Karkas Itik. Majalah Ilmiah Peternakan 3 (3): 67-71.

ii. Capra, Fritjop. 1975. The Tow of Physics. ISBN 0-7773-077-6 (cloth), 087773-078-4 (paper). 1123 Spruce Street Boulder Colorado: Shamba Publications, Inc.

iii. Donder, I K. 2014. http//www.scribed.com/doc/120238202/Agnihotra-dan-efek-Psiko.....,

iv. Ganesan, P.C. 2002. Gnihotra for Health, Wealth and Happiness. First ed.ISBN: 81-7478-304-0. Chemoi. Bangalor. Kolkata: Sura Books (Pvt).

v. Ganong, W.F. 1983. Review of Medical Physiology. 11th ed. ISBN: 0-87041-137-3. Lange Medical Publications. Drawer L, Los Altos, Calofornia 94022.

vi. Hill, H.T.B. 1977. Deseases and Parasites of Livestock in the Tropics. First. Publised. Longman Group Ltd. London.

vii. Mantra, I.B. 1989. Bhagawad Gita (Alih Bahasa dan Penjelasan). Proyek Penyuluhan dan Penerbitan Buku Agama. Pemda Tingkat I Bali.

viii. Mariani, N. P. dan Suryani, N. N.. 2004. Pengaruh Penggunaan Kulit Biji Coklat yang Dipermentasi Ragi dalam Ramsum Terhadap Jumlah Pad Fat dan Kadar Kolesterol Daging Itik Bali. Majalah Ilmiah Peternakan 7 (2): 64-69.

ix. Mariani, N. P. dan Bidura, I G. N. G. 2003. Pengaruh Suplementasi Ragi pada Ransum yang Mengandung Kulit Kacang Kedelai Terhadap Produksi Telur Ayam Lohman Brown. Majalah Ilmiah Peternakan 6 (3): 79 – 84

x. Scott, M.L., Nesheim, M. C. and Young, R. J. 1982. Poultry Feeding. Scott and Associates.

xi. Steel, R. G. D, and Torri, J. H. 1989. Principle and Procedures of Statistics. 2nd ed. McGraw-Hill International Book Co, London.

xii. Suasdiastra, I W., Putra I G, Sutrisna, I B. 2002. Penambahan Serbuk Gergaji Kayu, Ragi Tape, dan Kombinasinya dalam Ransum Basal Terhadap Distribusi Lemak Tubuh Ayam Pedaging. Majalah IlmiAH Peternakan 9 (3): 94 – 101.

xiii. USDA (United State Department of Agriculture). 1985. Nutrition and Your Health: Dietary Guidelines for Americans. Dept. of Health and Human Service 2nd ed. Home and Garden Bulletin No.232: U.S. Government Printing Office, Washington DC.

xiv. Wibawa. 2007. Kedahsyatan Agnihotra Yajna Suci yang Dilupakan.. PT Empat Warna Komunikasi, Denpasar.

xv. Jendra, I W. dan I M. Titib. 1999. Agnihotra Raja Upacara Multifungsi dan Efektif. Bali Homa Yajna, Denpasar.

xvi. Yupardhi, W.S., Matram, R.B., Wirtha, W. 2001. Fisiologi Hewan. Buku Ajar. UPT Penerbit Universitas Udayana. Denpasar.

xvii. Zalenka, J. 1968. Influence of the Age of Chicken on the Metabolizable Energy Values of Poultry Diets. Brit. Poult. Sci. 9 (2): 135.