



Performance of Quails with *Aloe vera* Extract and Acid cheese whey Supplementation

Feleciano R. Bejar¹

¹Asso. Professor, Northwest Samar State University, San Jorge Campus, San Jorge, Samar, Philippines

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ABSTRACT

A study was conducted to evaluate the effects of *Aloe vera* extract and Acid cheese whey on the growth and productivity of quails. A total of 300 quails distributed to 5 treatments with four replications using Complete Randomized Design (CRD). This was a four-month study starting from growing to laying period of quails. Treatment Levels were; T₁= 0mL AVE and ACW, T₂=15mL AVE, T₃=25mL AVE, T₄=15mL ACW, and T₅=25mL ACW per gallon of water. Results revealed no significant differences on final weight, gain weight, feed consumption, and water consumption except on feed conversion ratio which is significantly different among treatments. Numerically, birds with AVE and ACW supplementation showed higher performance on the parameters studied. Results suggests that *Aloe vera* extract and Acid Cheese Whey can be used to increase growth and egg production performance in quails.

KEY WORDS: *T. gigantea* leaf meal, *Aloe* extract, acid cheese whey, quail, egg qualities

INTRODUCTION

Rationale

The use of growth-promoting substances is now recognized and has been part of the production system management to effect faster growth of fowls. Many chemicals and biological preparations as additives are incorporated in the feeds or drinking water to improve feed utilization and efficiency. Thus, new product preparations out of local and indigenous herbs, shrubs, enzymes and probiotics are being investigated to test their efficacy and profitability when fed or supplemented to farm animals.

Vitamins and mineral supplementation, such as *Aloe Vera* (*Aloe barbadensis*) extract, cheese whey, lactic acids, probiotics and other natural growth promoters are added to the drinking water of poultry and livestock animals as substitute to synthetically and commercially prepared feed supplements. Their popularity in the field of animal production was due to the enhanced growth of animals, effect on resistance and consequently improved carcass and egg qualities.

The content of the *aloe vera* leaf is just 0.5-1.5% solid, with an average pH value of 4.55. This solid material contains over 75 different nutrients

including vitamins and minerals. *Aloe* is rich in vitamins and minerals which include; Vitamin A (B-carotene), Vitamin B1 (Thiamine), Vitamin B2 (Riboflavin), Vitamin B3 (Niacin), Vitamin B5, Vitamin B6 (Pyridoxine), Vitamin B12, Vitamin C, Vitamin E, Choline and Folic Acid. Among the important minerals found in *aloe vera* are: calcium, chromium, copper, iron, magnesium, manganese, potassium, phosphorous, sodium and zinc. These minerals are essential for good health and are known to work in synergistic combination with other vitamins and trace elements (<http://wholeleaf.com>, 1990).

Cheese Whey on the other hand, was estimated to be 42-44% out of the of the total solids in milk. These solids include over 90% of milk sugar, a portion of the mineral matter and fat, as well as very high percentage of water-soluble vitamins of the original milk. Typically, cheese whey is composed of 93.4% water, .35% fat, .85% protein, 4.8% milk sugar and 0.6% ash (Eckles, et al. 1957).

Hence, this study was conducted to ascertain the growth and egg production efficiency of quails supplemented with *aloe vera* extract and *cheese whey* in the drinking water.



MATERIALS AND METHODS

Preparation and Application of *Aloe Vera* extract and Acid Cheese Whey

Leaves were collected from the plant, weighed, washed to remove dirt's, sliced/chopped into pieces, and crushed using an electric blender or by hands. The gel from the solid materials was separated by straining with the use of cheese cloth or fine screen, then kept in container and preserved in a refrigerator to keep it fresh.

Acid cheese whey was obtained from the school white cheese project. The cheese whey was allowed to settle for few hours, strained, refrigerated and used as additive in the drinking water for the quails.

Experimental Birds, Design and Treatments

A total of 200 quail birds were randomly divided into 5 treatments in a Complete Randomized Design (CRD). At growing stage the quails were distributed into four blocks corresponding to four replicates with 10 quails per replicate. At laying period, 120 female birds were distributed in 4 blocks; 6 females birds were placed in every treatment replicate, with same distribution with the birds at growing period. The treatments evaluated in the experiment were:

	$T_1 = 0$ ml. <i>Aloe Vera</i> and <i>Acid cheese whey</i>
water	$T_2 = 15$ ml. <i>Aloe Vera</i> extract/gal. of
water	$T_3 = 25$ ml. <i>Aloe Vera</i> extract/gal. of
water	$T_4 = 15$ ml. <i>Acid cheese whey</i> /gal. of
water	$T_5 = 25$ ml. <i>Acid cheese whey</i> /gal. of

General Management Practices

Uniform cage sizes, feeding and drinking program were strictly followed with daily cleaning and renewal of water in each treatment. Lighting and ventilation were provided, and dung removal was done daily so as not to discomfort the experimental animals.

Data Collection and Analysis

Weekly data collection for growth and laying performance were made except for point of lay which was only taken at the start of laying and end of laying stage or end of the study period. Egg production performance were taken for 3 months of laying period.

All observations in each parameter were subjected to Analysis of Variance (ANOVA), and treatment means were compared based on Tukey's Honestly Significant Difference Test (HSD).

RESULTS AND DISCUSSIONS

Final and Gain Weights of Quails.

The result of final and gain weights showed no significant differences among treatments. However, numerical values showed that the final weights of quails without supplementation (T_1) had lower final weights than those birds with *Aloe vera* extract and Acid Cheese Whey (T_2 - T_5) in their drinking water. The result implies that supplementation of AVE and ACW influence the weights of the birds.

The data revealed a numerically higher gain in weights of the birds with 25ml of Acid Cheese Whey per gallon of drinking water followed by other levels of supplementations. The lower gain in weight was obtained by the birds without supplementation. However, no significant differences was observed based Tukey's Honestly Significant Difference Test. The result on AVE supplementation can be associated to the study of Alcantara, et al (2004) and Bejar, (2005), as well as the nutritional components of these two supplements cited in the literature.

Feed Consumption

Feed consumption of the quails did not show significant differences among treatments. Numerical values however showed that the quails supplemented with 25ml *Aloe vera* extract had lower feed consumption and the highest feed consumption was observed on the quails with 15ml Acid Cheese Whey in drinking water.

Feed Conversion Ratio

The feed conversion ratio of the quail in this study showed that treatment means are significantly different based on Tukey's HSD Test. As indicated, birds fed with 25ml Acid Cheese Whey had significantly higher feed conversion ratio than the other treatment supplementation. The higher FCR value was obtained by those birds without supplementation, which means they are less efficient in converting feeds into body weights. Hence, lower the FCR value of the birds (as the birds in T_5 -25ml ACW), are more efficient the birds are, in converting their feed consumed into live body weight gain or egg produced.

Water Consumption

Result showed that the mean water consumption of birds showed no significant differences among treatments. The highest water consumption for one month growing period of quails was observed on T_2 with 41.98 ml of water, followed by those birds in T_4 whose water consumption was 41.88 ml. The lowest water consumed was obtained by the quail birds without supplementation or those given only plain water.



Table 1. The growth performance of the quail for 1 month period.

Variables	Levels of AVE and ACW (ml)				
	T ₁ (0 ml. AVE/ACW)	T ₂ (15 ml. AVE)	T ₃ (25 ml. AVE)	T ₄ (15 ml. ACW)	T ₅ (25 ml. ACW)
Initial Weight (g)	21.17	22.58	22.25	21.08	21.33
Final weight (g)	100.75	103.08	103.33	103.50	107.17
Gain in weight (g)	79.58	80.50	80.67	82.42	85.83
Feed consumption (g)	392.33	394.75	389.25	396.50	390.58
Feed Conversion Ratio	4.93 ^a	4.90 ^a	4.83 ^{ab}	4.81 ^{ab}	4.55 ^c
Water consumption (ml)	41.06	41.98	41.30	41.88	41.40

Point of Lay and Egg production

There was no significant effects of *Aloe extract* and *acid cheese whey* supplementation on the point of lay and egg production of quails throughout the 3-month laying periods Table 2. However, numerical values showed higher point of lay among

quail layers with AVE and ACW supplementation, which means the birds have laid a little bit later than those without supplementation. And birds with 15 ml acid cheese whey supplementation shown the highest egg production throughout the 3 months laying period.

Table 2. The laying performance of quail for 3 months period.

Variables	Levels of AVE and ACW (ml)				
	T ₁ (0 ml. AVE/ACW)	T ₂ (15 ml. AVE)	T ₃ (25 ml. AVE)	T ₄ (15 ml. ACW)	T ₅ (25 ml. ACW)
Point of Lay (d)	58.08	59.83	59.08	59.33	59.42
Egg Weight (g)	9.38	9.46	9.40	9.40	9.45
% Egg Production (1 st month)	14.04	14.86	13.44	15.15	14.42
% Egg Production (2 nd month)	19.25	20.27	19.31	20.77	20.76
% Egg Production (3 rd month)	22.18	23.77	22.93	24.16	24.06

Financial Profitability

Among the supplementation treatments evaluated, birds with 15ml *Acid Cheese Whey* showed the highest net income and return on investment (Table

3). It can be observed that birds supplemented with *Aloe vera extract* and *Acid cheese whey* showed positive effect on net income and return on investment.

Table 3. The cost and return analysis of quail during the 4-month study period

Variables	Levels of AVE and ACW (ml)				
	T ₁ (0 ml. AVE/ACW)	T ₂ (15 ml. AVE)	T ₃ (25 ml. AVE)	T ₄ (15 ml. ACW)	T ₅ (25 ml. ACW)
Total Operating Costs ¹	97.73	97.85	98.73	97.89	97.76
Egg Produced ²	55.47	58.90	55.68	60.08	59.24
Sales of Eggs ³	110.94	117.80	111.36	120.16	118.48
Net Income ⁴	13.21	19.95	22.63	22.27	20.72
Return on Investment ⁵	13.52	20.39	22.92	22.75	21.19

¹ Include cost of quail chicks, feeds, labor, water and electric bill.

² Egg produced of the quail for 3 months.

³ Derived from multiplying the number of eggs produced by 2.00 pesos each.

⁴ Gross income (total sales) minus total operating cost.

⁵ Net income expressed as a percentage of total operating costs.



CONCLUSION

Based on the findings of the study it is concluded that Aloe Vera Extract and Acid Cheese Whey can improve growth, egg production and profitability performance of quails or to poultry species. The use of Aloe vera extract and Acid cheese being available in the locality can be used as supplement to poultry animals.

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