Uva Wellassa University of Sri Lanka
Faculty of Animal Science & Export Agriculture

BASc Degree Programme
Year IV Semester I
End Semester Examination – February/March 2012

ANS 462-2 Scientific writing and project cycle management

Instructions

Answer **three (03) questions** including **question No.1** in booklets provided.

No. of questions : Four (04)
No. of pages : Seven (07 including annex)
Time : Two hours (2 hrs)
Total marks allocated : 100%

Index No:

1. Read the research paper given in **pages 1-5 in Annex for question 1** and write an appropriate abstract of **not more than 250 words.** (50 marks)

2. What are the **elements** of a student proposal? Describe what you should include in each of the elements. (25 marks)

3. How do you define a stakeholder? Describe the importance of Stakeholder analysis in project planning. (25 marks)

4. The list of references given in **page 6** is not in alphabetical order and contains errors. Arrange the list of references in **alphabetical order** and **identify and correct** the errors (25 marks)

Annex for question 1

Effect of citric acid and acetic acid on the performance of broilers

Introduction

The feed additives have a number of beneficial effects like control of pathogenic microorganisms and enhance the growth of beneficial microorganisms (Shane, 1999). Antibiotics possess these beneficial effects but their use in the poultry industry has been intensively controversial because of the development of bacterial resistance and potential consequences on the human health. So, the alternatives to antibiotics are researched. Among these compounds, organic acids are promising alternatives (Hyden, 2000). Health of the gut is one of the major factors governing the performance of birds and thus, the economics of poultry production (Samik *et al.*, 2007) and the profile of intestinal microflora play an important role in gut health. Dietary organic acids and their salts are able to inhibit microbial growth in the food and consequently to preserve the microbial balance in the gastrointestinal tract. In addition, by modifying intestinal pH, organic acids also improve the solubility of the feed ingredients, digestion and absorption of the nutrients (Patten and Waldroup, 1988; Owings *et al.*, 1990; Skinner *et al.*, 1991; Adams, 1999).

Both, the feed industry and the poultry production sector, still suffer from huge losses due to the contamination of food with pathogenic bacteria and their related impacts in the animal, such as lower weight gains or even increased mortality. Poultry performance and feed efficiency are closely interrelated with the qualitative and quantitative microbial load of the host animal, including the load in the alimentary tract and in the environment. Organic acids like citric acid and acetic acid have been used in diets due to their positive effect on health and growth of bird. More recently, the ban on antibiotics as a growth promoter in the European Union and the resulting pressures on meat exporters around the world, have increased interest in organic acids to attain performance improvements in growing swine and poultry. As the uses of organic acids are becoming more acceptable to feed manufacturers, poultry producers and consumers, there is a growing interest in substituting them for antibiotic as growth promoters (Callsen, 1999). Citric acid and acetic acid are used as the substitute of antibiotic growth promoters in many countries of the world (Estieve *et al.*, 1997). But use of citric acid and acetic acid as substitute of antibiotic growth promoter in Bangladesh is a new phenomenon. The effects of citric acid and acetic acid as substitute of antibiotic have not yet been evaluated much under Bangladesh condition. Therefore, the present study was undertaken to evaluate the effect of feeding citric acid and acetic acid and their combination on the performance of broiler and to determine its economic impact in broiler production.

Materials and Methods

The experiment was conducted with 108 one day old straight run broiler chicks (Hubbard Classic) for a period of 35 days. The chicks were randomly divided into 4 equal treatment groups (A, B, C and D) each having 27 chicks. Each treatment was subjected to 3 equal replications of 9 chicks each. The diets were formulated with commonly available feed ingredients is shown in Table 1. The dietary treatments were A (control diet) and B, C and D were supplemented with 0.5% citric acid, 0.5% acetic acid and 0.5% citric acid + 0.5% acetic acid respectively with drinking water. Dry mash feed was supplied on *adlibitum* basis. Fresh clean drinking water was made at all the times. Adequate sanitary measures were taken during the experimental period. The birds were housed in cages of 120cm×76cm.

Table 1. The ingredients and chemical composition of control diet

Ingredients	Amount in the diet (%)
Maize	51.75
Soybean meal	42.00
Soybean oil	4.00
Salt	0.25
Di- Calcium Phosphate	0.50
Calcium premix	1.00
Vitamin-Mineral premix	0.75
DL-Methionine	0.15
Choline Chloride 60%	0.05
Chemical composition	**Amount (%)**
Dry matter	85.00
Crude protein	22.21
Crude fibre	5.88
Ether extract	1.76
Nitrogen free extract	48.41
Ash	6.96
ME(kcal/kg DM)	3241.22

Calculated according to wiseman(1987)

At the age of day 4 and 14, birds were vaccinated against Infectious Bursal Disease (IBD) using Bursine-2. Chicks were also vaccinated with B.C.R.D.V on 8th day. To evaluate the treatment effect, weight gain, feed conversion ratio, mortality, dressing percentage, economy of broiler production were recorded and calculated. At the end of experiment, two birds from each treatment were selected randomly to record the dressing yield, organs weight and cut up parts. Feed samples were analyzed for dry matter (DM), crude protein (CP), ether extract (EE), crude fiber (CF), nitrogen free extract (NFE), and total ash by following the method of AOAC (1990). Duplicate samples were analyzed and the average value was taken. Collected and calculated data were analyzed for analysis of variance (ANOVA). The significant differences were identified by LSD among the treatments.

Results and Discussion

Body weight gain

Effect of organic acids inclusion in broiler ration on live weight gain is presented in Table 2. Significant ($P<0.05$) difference in body weight of birds among the groups were observed at all ages. Birds on treatment C showed lower ($P<0.05$) weight gain than control group (A) and treatment B showed the highest ($P<0.05$) weight gain. Treatment D showed improved growth when administration of both citric acid in diets and acetic acid in water was done together. The growth retardation in treatment C seemed to be a consequence of a depressed water intake induced by application of acetic acid in water. The result is in agreement with Schuhmacher *et al.* (2006), who found lower weight gain. Highest weight gain on 0.5% citric acid agreed with previous findings of Shen-HuiFang *et al.* (2005); Denil *et al.* (2003) and Stipkovits *et al.* (1992) where improved weight gain was observed with administration of citric acid in diets at 0.3, 0.5 and 0.7%, respectively. The results contradict with the findings of previous researchers Pinchasov *et al.* (2000) where depressed weight gain was observed with application of acetic acids in diets.

Table 2. Live weight gains at different weeks in different treatments Age (weeks)

Age(weeks)	Dietary treatments				SEM	Level of sig.
	A	B	C	D		
Initial weight (g)	46.2 ± 0.59	46.1 ± 0.56	46.4 ± 0.28	46.1 ± 0.33	0.37	
1	84.5 ± 4.37^{a}	88.7 ± 1.64^{a}	73.1 ± 3.32^{b}	70.3 ± 2.03^{b}	2.61	*
2	210.3 ± 12.19^{a}	219.8 ± 11.48^{a}	175.0 ± 4.37^{b}	176.6±7.84^{b}	7.72	*
3	286.4 ± 5.89^{ab}	299.2 ± 15.19^{a}	247.6 ± 3.71^{c}	281.0 ± 3.82^{b}	6.10	*
4	396.8 ± 13.63^{b}	447.2 ± 24.06^{a}	368.5± 28.51^{b}	372.2 ± 9.62^{b}	16.78	*
5	403.5 ± 23.97^{c}	451.5 ± 16.72^{b}	424.7±26.21^{bc}	507.9 ± 2.90^{a}	16.79	*
0-4	977.9 ± 22.27^{b}	1054.0±20.86^{a}	864.2 ± 24.77^{c}	900.1 ± 13.85^{c}	17.11	*
0-5	1381.4 ± 9.88^{b}	1506.3 ± 4.16^{a}	1289.0±19.86^{c}	1408.0±19.21^{b}	12.25	*
Final body weight (g)	1427.6± 10.15^{b}	1552.4 ± 4.12^{a}	1335.4±20.09^{c}	1454.1±19.09^{b}	12.09	*

A= Control diet; B= Control diet + 0.5% citric acid; C= Control diet + 0.5% acetic acid; D= Control diet + 0.5% citric acid + 0.5% acetic acid; ±= Standard deviation; SEM= Standard Error Mean; Figure having different superscript in the same row differ significantly (P<0.05); *= 5% level of significance; NS= non significant.

Feed intake

The average feed intake of birds fed on different diets is shown in Table 3. It is evident that average feed intake was lower in treatment A and higher in treatment D and differed statistically (P<0.05) only at 2nd and 3rd week of age. These results contradict with the finding of previous researchers (Darko *et al.*, 1991; Frigg *et al.*, 1983 and Stipkovits *et al.*, 1992) where depressed feed intake was observed. During (0-4 weeks) of age feed intake was the highest in treatment B (1787.00g) and the lowest in treatment C (1681.00g). During (0-5 weeks) of age feed intake was the highest in treatment B (3118.56g) and the lowest in treatment A (2913.16g) but difference was non-significant (P>0.05). The lower feed intake in treatment C was accompanied by retarded growth to be the consequence of depressed water intake by the application of acetic acid in water.

Table 3. Feed intake (g) at different weeks of experimental birds in different treatments Age (weeks)

Age(weeks)	Dietary treatments				SEM	Level of sig.
	A	B	C	D		
1	122.3 ± 1.42	124.1±1.0	120.0 ± 6.19	117.0 ± 0.64	2.88	NS
2	320.9 ± 15.94^{a}	325.9±5.70^{a}	292.2 ± 3.02^{b}	301.1±2.94^{b}	7.05	*
3	514.5 ± 14.61^{bc}	532.9 ± 7.86^{ab}	499.1 ± 22.62^{c}	561.1 ± 14.70^{a}	13.02	*
4	738.2 ± 39.24	804.4 ± 39.49	769.9 ± 58.60	801.9 ± 13.26	33.56	NS
5	1217.2 ± 105.67	1331.2± 84.39	1348.8±166.65	1320.8± 12.64	87.58	NS
0-4	1696.0 ± 70.46	1787.0± 42.69	1681.0± 72.30	1781.0± 30.81	46.62	NS
0-5	2913.2 ± 142.90	3118.6±126.99	3029.9±237.88	3101.9±106.8	125.20	NS

A= Control diet; B= Control diet + 0.5% citric acid; C= Control diet + 0.5% acetic acid; D= Control diet + 0.5% citric acid + 0.5% acetic acid; ±= Standard deviation; SEM= Standard Error Mean; Figure having different superscript in the same row differ significantly (P<0.05); *= 5% level of significance; NS= non significant.

Feed conversion

The effect of organic acid supplementation on feed conversion is presented in Table 4. It is evident that FCR differ significantly (P<0.05) among treatments at all ages. Better feed conversion was found in treatment B and lower in treatment C during 0-5 weeks of age. The highest feed conversion on the administration of citric acid was in agreement with the findings of Afsharmanesh *et al.* (2005) who found higher feed conversion with the administration of citric acid in poultry.

Table 4. Feed conversion ratios of birds in different treatments Age (weeks)

Age(weeks)	Dietary treatments				SEM	Level of sig.
	A	B	C	D		
0-2	1.5 ± 0.02[b]	1.5 ± 0.06[b]	1.7 ± 0.09[a]	1.7 ± 0.08[a]	0.281	*
0-3	1.7 ± 0.03[b]	1.6 ± 0.01[b]	1.8 ± 0.04[a]	1.9 ± 0.05[a]	0.630	*
0-4	1.7 ± 0.03[b]	1.7 ± 0.01[b]	1.9 ± 0.04[a]	1.9 ± 0.04[a]	0.630	*
0-5	2.1 ± 0.12[b]	2.1 ± 0.08[b]	2.4 ± 0.16[a]	2.2 ± 0.01[ab]	0.089	*

A= Control diet; B= Control diet + 0.5% citric acid; C= Control diet + 0.5% acetic acid; D= Control diet + 0.5% citric acid + 0.5% acetic acid; ±= Standard deviation; SEM= Standard Error Mean; Figure having different superscript in the same row differ significantly (P<0.05); *= 5% level of significance

Carcass characteristics

Organs weight

It is evident from the Table 5 that dressing percentage for treatment A, B, C and D were 54.98, 55.40, 51.90 and 56.80 % respectively which did not differ significantly (P>0.05). The results are in well agreement with the previous findings (Kahraman *et al.*, 1997) where no significant effect was observed. The highest (56.7%) value for carcass yield was found in treatment D and the lowest (51.8%) value was found in treatment C.

Table 5. Carcass characteristics of broilers in different treatments

Parameters	Dietary treatments				SEM	Level of sig.
	A	B	C	D		
Live weight (g)	1146.7±152.0	1300.0±0.00	1150.0±132.0	1150.0 ± 150.0	102.74	NS
Organ weights (% live weight)						
Killed weight	89.6 ± 3.56	89.9 ± 3.67	89.2 ± 2.63	89.9 ± 1.42	2.43	NS
Shank weight	4.6 ± 0.66	4.9 ± 0.44	4.9 ± 0.43	4.9 ± 0.13	0.373	NS
Head weight	3.9 ± 0.45	3.9 ± 0.00	3.5 ± 0.38	3.2 ± 0.31	0.851	NS
Giblet weight	7.3 ± 0.60	7.2 ± 0.80	7.3 ± 0.81	7.2 ± 0.59	0.578	NS
Skin weight	16.2 ± 1.12	15.1 ± 1.24	15.7 ± 1.32	14.8 ± 0.19	0.873	NS
Visceral weight	7.8 ± 0.95	7.7 ± 0.39	7.3 ± 0.35	7.7 ± 0.36	0.466	NS
Carcass yield	54.98 ± 2.24	55.4 ± 2.66	51.9 ± 4.63	56.8± 3.08	2.67	NS

A= Control diet; B= Control diet + 0.5% citric acid; C= Control diet + 0.5% acetic acid; D= Control diet + 0.5% citric acid + 0.5% acetic acid; SEM= Standard Error Mean; NS= non significant.

In dietary treatment D the dressing yield was improved by about 3.46 % when compared with the control group. This result did not agree with previous findings of Garcia *et al.* (2000) who found decrease carcass yield. The increased dressing yield on dietary treatment D might be due to increasing live weight on 0.5% citric and acetic acid. The result partially agreed with Sapra and Mehta (1990), who found increased edible meat yield with increasing body weight. Per cent giblet weight was not affected by dietary treatments. Weight of shank in different treatments did not differ significantly (P>0.05) among different dietary treatments. Head weight was similar in all treatments. Skin and feather weight per cent did not differ significantly (P>0.05) among treatments.

Economy of broiler production

The production cost of broiler in different dietary treatments is shown in Table 6. The feed cost was highest (Tk.1559.49) in treatment D and the lowest (Tk. 1464.48) in treatment A (control group). The addition of 0.5% citric acid in diets and 0.5% acetic acid in water resulted in an increased feed cost in treatment B, C and D against treatment A (Control group). Cost per kg live weight of broiler was the highest in treatment C (Tk. 69.21) followed by treatment A (60.35), B (60.70) and D (63.77) respectively. Net profit per kg live broiler was the highest in treatment A (Tk. 19.70) followed by treatment B (Tk 19.30), C (Tk.10.70) and D (Tk.16.20) respectively. The highest total net profit was observed in dietary treatment B and the lowest total net profit was observed in treatment C as compare to treatment A (Control group).

Table 6. Production cost of broiler in different dietary treatments

Parameters	Dietary treatments			
	A	B	C	D
Total feed cost	1464.48	1568.04	1523.30	1559.49
Total chick cost	378	378	378	378
Management cost[1]	484.59	537.35	502.68	566.20
Total acid cost	-	60.31	90.77	156.27
Total production cost (Tk.)	2327.07	2543.73	2494.75	2503.69
Total production cost (Tk.)/kg live weight	60.35	60.70	69.21	63.77
Total sale priced (Tk.)	3084.48	3352.32	2883.60	3140.64
Total net profit (Tk.)	757.48	808.59	388.25	636.95
Net profit (Tk.)/kg live weight	19.70	19.30	10.70	16.20

A= Control diet; B= Control diet + 0.5% citric acid; C= Control diet + 0.5% acetic acid; D= Control diet + 0.5% citric acid + 0.5% acetic acid. NB-cost of feed calculated based on ingredients and test substances added.
[1] Management cost assuming approximately 33% of total cost (except chick cost).

t may be concluded that supplementation of 0.5% citric acid (B) in the diet showed positive effect on live weight, feed intake and feed conversion efficiency with no detrimental effect on carcass characteristics.

References

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