

BIBLIOGRAPHY

MOLTIO, LEMUEL JOHN P. APRIL 2012. Performance of Sunshine Chickens Given Different Levels of Supplemental Chopped Cabbage Leaves. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was implemented to determine the effect of chopped cabbage leaves as a feed supplement to sunshine chickens. Specifically, it aimed to determine the effect of chopped cabbage leaves in terms of gain in weight, feed consumption, feed conversion ratio, feed cost to produce a unit gain in weight, return on investment of the production and determine which level of chopped cabbage leaves will give the best result on the performance of sunshine chickens and the profitability of raising broilers fed with commercial feeds supplemented with chopped cabbage leaves.

The result of statistical analysis showed no significant differences in terms of the initial weight and final weights, gain in weight, feed consumption, feed conversion ratio, and feed cost per unit gain in weight.

Even though the net income and return on investments (ROI) were not subjected to statistical analysis, results of study showed negative incomes and ROI's from the birds in all the treatments. This was mainly due to the fact that during the pre-experimental period, all the birds in the treatments incurred chronicle respiratory disease (CRD) that affected their growth rate resulting to a lower final weight of the birds.

It is therefore concluded that chopped cabbage leaves could not be possibly incorporated to the ration of broilers.



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INTRODUCTION

Broiler production has a significant contribution to the livestock and poultry industry in the Philippines. Its production system highly depends on commercially produced feeds, making it easier to establish as income and food source for amateur entrepreneurs. Broiler production, which is the common type raised particularly in provinces, is a leading poultry meat source in the country. Within 35-40 days, the desired quantity and quality may be achieved, a very short period of time to have a capital turnover and generate income (Emuslan, 2010).

In fact, chicken broiler is one of the most progressive animal enterprises in the Philippines today. The poultry industry indeed began as the backyard enterprise but has shifted to the formation of very large integrated contract farming operations.

Because of the high cost of commercial feeds, some farmers are utilizing some source of other raw materials that can be added to the feeds of these broilers. Generally, Scorpio cabbage can be a good supplement in terms of growth production. Cabbage is a popular cultivar of the species *Brassica oleraceae* (Capitata Group) of the family Brassicaceae (or Cruciferae) and is used as a leafy green vegetable. It is a herbaceous, biennial, dicotyledonous flowering plant distinguished by a short stem upon which is crowded by a mass of leaves, usually green but in some varieties red or purplish, which while immature form a characteristic compact, globular cluster (cabbage head). The high nutrient content and numerous medicinal properties of cabbage make it popular throughout the world. Cabbage is an excellent source of manganese, calcium, and potassium. It is a very good source of iron, phosphorous, and magnesium. It is also a very good source of fiber, folate, and omega-3 fatty acids. Moreover, cabbage is an excellent



source of vitamin C. it is also a good source of thiamine (vitamin B1), riboflavin (vitamin B2), niacin, and vitamin B6. It is also contain good amounts of vitamin K, vitamin A and protein. Thus, this cabbage is not just merely for human consumption but also for animals, such as pigs, rabbits, chickens and other more.

This study gives improvement for broiler production through manipulation of feeding and techniques of chopped cabbage leaves, considering specifically the feeding program and to increase poultry meat production. Thus, it can give a significant increase in income of farmers.

Feeding birds using different kind of feeds research is one of the most important factors that affect the success of a farm enterprise. It is important to the poultry raisers to know what the best feed for their bird is. Thus, this study helps the poultry raisers to know how to manage and care their poultry species in terms of feeding management to come out with the best result on the growth performance of sunshine chickens given different levels of chopped cabbage leaves. The study is important to students most especially those who are conducting studies about poultry production as it will serve as their reference material. Indeed, this will help researchers to pursue further studies using this chopped cabbage leaves on the production of broilers. Lastly, this study hopes to help improve the productivity of broiler here in our locality.

The general objective of this study was to determine the effect of chopped cabbage leaves as a feed supplement to sunshine chickens. Specifically, it aimed to determine the effect of chopped cabbage leaves in terms of gain in weight, feed consumption, feed conversion ratio, feed cost to produce a unit gain in weight and morbidity and mortality rates.



It also aimed to determine which level of chopped cabbage leaves gives the best result on the performance of sunshine chickens and the profitability of raising broilers when fed with commercial feeds supplemented with chopped cabbage leaves.

This study was conducted on January, 2012 to March, 2012 and was conducted at the Benguet State University (BSU) Experimental Poultry House at Balili, Km 5, La Trinidad, Benguet.



REVIEW OF LITERATURE

Bautista and Mabesa (1977) stated that green leafy vegetables such as Chinese cabbage, pechay, mustard, kangkong, cabbage, saluyot, katuray, and young leaves of sweet potato, ampalaya, sitao, gabi, chayote, malunggay, and squash are rich in vitamin A and vitamin C. they cited also that green leafy and yellow supply of vegetables has a large percentage of the allowance for vitamin A.

Bautista and Dela Cruz reported that cabbage contains about 91% water, but it is quite high in vitamin C or ascorbic acid. However, cooked cabbage contains less ascorbic acid and thiamin than raw cabbage. Green cabbage is more nutritious than the white ones because it contains carotenoids or vitamin A. they also mentioned that ascorbic acid or vitamin A prevents scurvy, while thiamin known as vitamin B is necessary for growth and reproduction. Vitamin A prevents night blindness, increase the resistance of the body from infection, and it is necessary for the normal functioning of the glands.

Heuser (1955) stated that cabbage is a succulent food. The vitamin content is not so great as in the kind of green food with thin leaves. The outer greener leaves also contain most of the vitamins. It makes an excellent unmarketable heads which may be used to advantage in poultry feeding. He mentioned that waste leaves of cabbage, cauliflower, broccoli, and other plants can be utilized. This was confirmed by Diplat (1996) who showed that supplementation of cabbage leaf meal had no significant effect on the growth performance of broilers. However, the cost of feeds per kilogram in weight was lowered resulting to an additional increase in profit.



The composition analysis of cabbage according to the Food and Nutrition Research Center (1980) as cited by the Asian Vegetable Research and Development center, Vegetable Production Training Manual (1990) is as follows:

Nutrient Composition of Cabbage (100g)

Edible Portion (E.P.)

Moisture= 92.8%	Thiamine= 0.04 mg
Calcium= 74 mg	Sodium= 11 mg
B carotene= 20 mg	Riboflavin= 0.07 mg
Food energy= 25.0 cal	Potassium= 212 mg
Phosphorous= 28 mg	Niacin= 0.03 mg
Protein= 1.4%	Ascorbic acid= 42 mg
Iron= 0.08 mg	Edible portion= 81%



MATERIALS AND METHODS

Materials

The materials and equipment that was used in the study includes 120 day-old sunshine chickens, brooding-rearing cages, commercial feeds, disinfectant, feed containers, drinking and feeding troughs, electric bulbs (100 watts), old news papers, waterers, feeders, weighing scale, record book and chopped cabbage leaves.

Methodology

Pre-Experimental period. The stock was procured from reliable distributor of day old chicks in Baguio City. The cabbage was purchased and collected from one of the cabbage growers in La Trinidad, Benguet.

Two weeks before the arrival of the chicks, the brooding and rearing cages including the drinking and feeding troughs were cleaned thoroughly and disinfected. The lighting system was checked if functional. Two days before the arrival of the chicks, old news paper sheets were spread to cover the floor of the brooder. This helped conserve heat and prevented the entrance of draft inside the brooding cage. It served as receptacles for the feeds in the first few days. Finally, about two hours before the arrival of the chicks, the incandescent bulbs inside the brooder cages were switched-on to ensure that the cages are already warm when the chicks are placed into it.

Upon the arrival of the chicks, they were placed in the brooding cages and were brooded as a group. They were subjected to the same care and management. They were fed with commercial chick booster for the first two weeks and these were shifted to starter crumbles for another two weeks. To ensure good health of the birds, their drinking



water was medicated with vetracine multi-vitamin soluble particularly in their first two weeks. The lights were switched-on for 23 hours and switched-off for at least an hour.

Experimental period. At the start of the fifth week or the 29th day, the chicks were divided randomly into four treatments following the Completely Randomized Design (CRD). Each treatment was replicated three times with 10 birds per replication making a total of 30 birds per treatment. However, before the birds were placed into their respective cages, their initial weights were taken first.

The following treatments are as follows:

T₀- Control (pure commercial feeds)

T₁- 100 grams chopped cabbage leaves per kilogram feed

T₂- 200 grams chopped cabbage leaves per kilogram feed

T₃- 300 grams chopped cabbage leaves per kilogram feed

The birds in all treatments were subjected to the same care and management except on the level of chopped cabbage leaves added to their ration. The birds on the control (T₀) were given pure commercial feeds, while the birds that were assigned to T₁ were given 100 grams chopped cabbage leaves per kilogram feed, in T₂ birds were given 200 grams of chopped cabbage leaves per kilogram feed, and those under T₃ were given 300 grams of chopped cabbage leaves per kilogram feed. Feeding of the birds was done three times a day, 6:00 in the morning, 12:00 noontime, and 6:00 in the afternoon. The birds were fed the above rations for another two weeks or until the birds were 45 days old which was the end of the study. Fresh water was always available. Feeding and drinking troughs were cleaned daily to maintain good health of the birds. Lighting was only done at night time.



Preparation of chopped cabbage leaves. Cabbages were washed thoroughly with clean water. It was later chopped into small slices. The resulting chopped cabbages were added manually to the commercial feeds on the specified level of treatment.

Data Gathered

1. Initial weight of the birds (kg). This was obtained by weighing the chicks individually at the start of the study (29 days of age).

2. Final weight of the birds (kg). This was taken by getting the total weight of the birds at the end of the study.

3. Feeds offered. This refers to the amount of feeds given to the birds at the start of the study.

4. Feeds left-over. This refers to the amount of feeds not consumed by the birds which was obtained every morning before feeding time.

5. Number of morbidity and mortality. These refer to the number of birds that suffers from sickness and the number of birds that died during the conduct of the study.

6. Production cost. This refers to the cost of each of the items used in the study and other expenditures incurred in the study.

Data Computed

1. Average initial weight. This was taken at the start of the study by adding all the weights of the birds in each treatment and was divided by the total number of birds per replicates.

2. Average final weight. This was taken at the end of the study by adding all the weights of the birds in each treatment and was divided by the total number of birds per replicates.



3. Total gain in weight of the birds (kg). This was taken by subtracting the initial weight from the corresponding final weight of the individual birds.

4. Total feed consumption (kg). This was taken by adding the total amount of feed consumed by the birds from the beginning until the termination of the study.

5. Feed conversion ratio (FCR). This was taken by dividing the total feed consumption by the total gain in weight of the birds.

6. Feed cost per unit gain in weight (Php). This was taken by multiplying the total feed conversion ratio by the average price of feeds per kilo.

7. Morbidity rate. This was taken by dividing the number of birds that got sick by the total number of birds multiplied by 100.

8. Mortality rate. This was taken by dividing the number of birds that died by the total number of birds multiplied by 100.

9. Net profit (Php). This was taken by multiplying the final weight of the birds (input) by the price per kilogram live weight of birds (output).

10. Returned of investment (ROI). This was taken by using this formula:

$$\text{ROI} = \frac{\text{Net Profit}}{\text{Total Cost of Production}} \times 100$$

Data Analysis

All the data that was gathered were consolidated, tabulated, and subjected to analysis of variance for completely randomized design (CRD). The Duncan's Multiple Range Test (DMRT) was used to determine the significance between the treatment means.



RESULTS AND DISCUSSION

Body Weights

Table 1 shows the statistical analysis that control treatment (T₀), treatment 1 (T₁), treatment 2 (T₂), and treatment 3 (T₃) have the same mean initial and final weights. Hence, statistical analysis revealed that there are no significant differences in their mean initial (29 days old) and final (45 days old) weights.

Total Gain in Weight

Table 2 presents the total gain in weight of the birds in the different treatments. Statistical analysis shows no significant differences in all the treatments. This implies that all the treatments had more or less the same value in terms of their gain in weight.

Table 1. Mean Initial (29 days old) and final (45 days old) weights of the birds (kg)

TREATMENT	MEAN*	
	INITIAL	FINAL
T ₀ - Commercial feeds (CF), control	0.277	0.83
T ₁ -CF + 100g chopped cabbage leaves per kg feeds	0.291	0.84
T ₂ - CF + 200g chopped cabbage leaves per kg feeds	0.295	0.86
T ₃ - CF +300g chopped cabbage leaves per kg feeds	0.302	0.83

*Means with the same superscript are not significantly different (P>0.05) DMRT



Total Feed Consumption

Table 3 presents no statistical difference in all the treatments. This implies that control treatment (T₀) and all the treatments that were supplemented with chopped cabbage leaves (T₁, T₂, and T₃) have more or less the same total feed consumption value.

Table 2. Total gain in weight of the birds from 29 to 45 days old by treatment (kg)

TREATMENT	MEAN*
T ₀ - Commercial feeds (CF), control	0.558
T ₁ -CF + 100g chopped cabbage leaves per kg feeds	0.553
T ₂ - CF + 200g chopped cabbage leaves per kg feeds	0.551
T ₃ - CF +300g chopped cabbage leaves per kg feeds	0.525

*Means with the same superscript are not significantly different (P>0.05) DMRT

Table 3. Total feed consumption of the birds from 29 to 45 days old by treatment (kg)

TREATMENT	MEAN*
T ₀ - Commercial feeds (CF), control	1.605
T ₁ -CF + 100g chopped cabbage leaves per kg feeds	1.592
T ₂ - CF + 200g chopped cabbage leaves per kg feeds	1.595
T ₃ - CF +300g chopped cabbage leaves per kg feeds	1.593

*Means with the same superscript are not significantly different (P>0.05) DMRT



Feed Conversion Ratio (FCR)

Table 4 presents the mean of feed conversion ratio of all treatments. Statistical analysis revealed that there are no significant differences in all the treatments. It implies that the birds had more or less the same amount of feeds to produce a kilogram increase in body weights.

Feed Cost per Unit Gain in Weight

Presented in Table 5 is the feed cost per unit gain in weight. Result showed that there are no significant differences in all the treatments. This implies that the birds had more or less the same value in terms of feed cost per unit gain in weight.

Morbidity and Mortality Rate

There were chicks that got sick and died but this was incurred during the pre-experimental period or brooding stage. But the good health of the birds was maintained all throughout the study period.

Table 4. Feed conversion ratio of the birds from 29 to 45 days old by treatment

TREATMENT	MEAN*
T ₀ - Commercial feeds (CF), control	2.890
T ₁ -CF + 100g chopped cabbage leaves per kg feeds	2.886
T ₂ - CF + 200g chopped cabbage leaves per kg feeds	2.896
T ₃ - CF +300g chopped cabbage leaves per kg feeds	3.038

*Means with the same superscript are not significantly different (P>0.05) DMRT



Table 5. Feed cost per unit gain in weight by treatment (kg)

TREATMENT	MEAN*
T ₀ - Commercial feeds (CF), control	83.800
T ₁ -CF + 100g chopped cabbage leaves per kg feeds	83.703
T ₂ - CF + 200g chopped cabbage leaves per kg feeds	82.949
T ₃ - CF +300g chopped cabbage leaves per kg feeds	88.121

*Means with the same superscript are not significantly different (P>0.05) DMRT

Table 6. Net income and Returns on Investment (ROI) observed from the birds

TREATMENT	TOTAL SALES (Php)	TOTAL COST (Php)	NET INCOME (Php)	ROI (%)
Control (commercial feeds)	3630.08	7218.45	-3588.37	-49.71
100 grams chopped cabbage leaves per kilogram feeds	3669.95	7267.65	-3597.7	-49.50
200 grams chopped cabbage leaves per kilogram feeds	3746.08	7310.08	-3564.00	-48.75
300 grams chopped cabbage leaves per kilogram feeds	3614.85	7349.00	-3734.15	-50.81



Return on Investment

Table 6 showed the return on investment in the different treatments. Although this was not subjected to statistical analysis, as presented in the table, it is shown that negative profits were obtained from the birds in all the treatments. This was due to the fact that during the pre-experimental period, all the birds in the treatments incurred chronic respiratory disease (CRD) that affected their growth rate resulting to a lower final weight of the birds.



SUMMARY, CONCLUSION, AND RECOMMENDATION

Summary

The study was conducted to determine the response of sunshine chickens given different levels of supplemental chopped cabbage leaves. The birds used on the study were 120- 29- day old sunshine chicken. This was conducted at the Benguet State University (BSU) Experimental Poultry House, La Trinidad, Benguet from January 20 to March 05, 2012.

Specifically, the study aimed to determine the effect of chopped cabbage leaves in terms of gain in weight, feed consumption, feed conversion ratio, feed cost to produce a unit gain in weight, morbidity and mortality rates. Following the completely randomized design (CRD), the birds were randomly distributed into four treatments. Each treatment was replicated three times with 10 birds per replication. The different treatments were as follows: T₀ (pure commercial feeds); T₁ 100 grams chopped cabbage leaves per kilogram feeds; T₂ 200 grams chopped cabbage leaves per kilograms feeds; T₃ 300 grams chopped cabbage leaves per kilograms feeds.

The result of statistical analysis showed no significant differences in terms of the average initial and final weight, gain in weight, feed consumption, feed conversion ratio and feed cost per unit gain in weight.

The computed net income is negative due to the fact that the birds incurred chronic respiratory disease (CRD) during the pre-experimental period that affected their growth rate. However, results of the study showed that better ROI's were obtained from the birds given 200 grams of chopped cabbage leaves per kilogram feeds.



Conclusion

There are no significant differences in the performance of sunshine chickens given supplemental chopped cabbage leaves.

Recommendation

Since birds from control treatment and birds from experimental treatments did not vary significantly, it is recommended that supplementation of chopped cabbage leaves to the diet ration of broiler is not applicable.



LITERATURE CITED

- BAUTISTA, OK. and R.C. MABESA. 1977. Vegetable production. Revise edition. University of the Philippines, College of Agriculture. Pp. 10-14
- BAUTISTA, OK. and A.M. DELA CRUZ (nd). Cabbage production in the Philippines. University of the Philippines at Los Banos, College of Agriculture, Laguna. Pp. 1-2
- DIPLAT, M.S. 1996. Growth performance of broilers given cabbage leaf meal as feed supplement. Unpublished B.S. Thesis. Benguet State University. La Trinidad, Benguet. Pp. 27
- EMUSLAN, RH. 2010. Effect of palm kernel meal on the growth performance of broilers. B.S. thesis. Benguet State University, La Trinidad, Benguet. Pp. 1
- HEUSER, C.F. 1995. Feeding poultry. Second edition. New York: John Wiley and Son's Inc. Pp. 243
- VEGETABLE PRODUCTION TRAINING MANUAL. 1990. Asian vegetable research and development center. PO BOX 205, Taipei 10099.



APPENDICES

Appendix Table 1. Mean initial weights (29 days old) of the birds by treatment (kg)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	0.285	0.251	0.295	0.831	0.277
T ₁	0.310	0.295	0.268	0.873	0.291
T ₂	0.240	0.332	0.314	0.886	0.295
T ₃	0.350	0.289	0.268	0.90	0.302
GRAND TOTAL				3.50	
GRAND MEAN					0.29

ANALYSIS OF VARIANCE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	TABULAR F	
					0.05	0.01
TREATMENT	3	0.0010	0.000343	0.2647 ^{ns}	4.0662	7.5910
ERROR	8	0.0104	0.001294			
TOTAL	11	0.0114				

^{ns}= Not Significant

CV= 3.42%



Appendix Table 2. Means final weights (29 days old) of the birds by treatment (kg)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	0.85	0.84	0.81	2.50	0.83
T ₁	0.89	0.81	0.83	2.53	0.84
T ₂	0.84	0.89	0.86	2.58	0.86
T ₃	0.81	0.82	0.86	2.49	0.83
GRAND TOTAL				10.11	
GRAND MEAN					0.84

ANALYSIS OF VARIANCE

SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	TABULAR F	
					0.05	0.01
TREATMENT	3	0.0016	0.00055	0.6625 ^{ns}	4.0662	7.5910
ERROR	8	0.0066	0.000829			
TOTAL	11	0.082				

^{ns} = Not Significant

CV= 3.42%



Appendix Table 3. Total gains in weight of the birds by treatment (kg)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	0.568	0.590	0.515	1.673	0.558
T ₁	0.580	0.517	0.561	1.658	0.553
T ₂	0.579	0.532	0.543	1.654	0.551
T ₃	0.499	0.532	0.545	1.576	0.525
GRAND TOTAL				6.56	
GRAND MEAN					0.55

ANALYSIS OF VARIANCE							
SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	TABULAR F		
					0.05	0.01	
TREATMENT	3	0.0019	0.000634	0.6857 ^{ns}	4.0662	7.5910	
ERROR	8	0.0074	0.000924				
TOTAL	11	0.0093					

^{ns}= Not Significant

CV= 5.56%



Appendix Table 4. Total feed consumption of the birds by treatment (kg)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	1.604	1.593	1.618	4.815	1.605
T ₁	1.584	1.597	1.594	4.775	1.592
T ₂	1.590	1.593	1.601	4.784	1.595
T ₃	1.591	1.599	1.590	4.780	1.593
GRAND TOTAL				19.15	
GRAND MEAN					1.60

ANALYSIS OF VARIANCE						
SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	0.05	0.01
TREATMENT	3	0.0003	0.000109	0.2647 ^{ns}	4.0662	7.5910
ERROR	8	0.0005	0.00065			
TOTAL	11	0.0008				

^{ns} = Not Significant

CV = 0.51%



Appendix Table 5. Feed conversion ratio (FCR) of the birds by treatment (kg)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	2.828	0.27	3.141	8.669	2.880
T ₁	2.731	3.088	2.841	8.66	2.886
T ₂	2.746	2.994	2.948	8.688	2.896
T ₃	3.188	3.011	2.917	9.116	3.038
GRAND TOTAL				35.133	
GRAND MEAN					2.927

ANALYSIS OF VARIANCE						
SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	0.05	TABULAR F 0.01
TREATMENT	3	0.049387	0.016462333	0.54 ^{ns}	4.0662	7.5910
ERROR	8	0.242474	0.03030925			
TOTAL	11	0.291861				

^{ns}= Not Significant

CV= 5.95%



Appendix Table 6. Feed cost per unit gain in weight by treatment (Php)

TREATMENT	REPLICATION			TOTAL	MEAN
	I	II	III		
T ₀	82.012	78.3	91.089	251.401	83.800
T ₁	79.17	89.552	82.389	251.111	83.703
T ₂	79.634	86.826	85.492	248.849	82.949
T ₃	92.452	87.319	84.593	264.364	88.121
GRAND TOTAL				1015.725	
GRAND MEAN					84.643

ANALYSIS OF VARIANCE						
SOURCES OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARE	MEAN SQUARE	COMPUTED F	TABULAR F	
					0.05	0.01
TREATMENT	3	49.6758363	16.5586121	0.18 ^{ns}	4.0662	7.5910
ERROR	8	722.1781937	90.27227421			
TOTAL	11	771.85403				

^{ns}= Not Significant

CV= 11.22%



Appendix Table 7. Total cost of production and returns on investment (ROI) by treatment

PARTICULARS	T ₀ (Php)	T ₁ (Php)	T ₂ (Php)	T ₃ (Php)
Feeds:				
Chick booster	2326.8	2326.8	2326.8	2326.8
Chick starter	2301.6	2301.6	2301.6	2301.6
Broiler finidher	1300.05	1289.25	1291.68	1290.6
Chopped cabbage	-	60.00	100.00	140.00
Stocks	1200.00	1200.00	1200.00	1200.00
Multivitamins	60.00	60.00	60.00	60.00
Disinfectant	30.00	30.00	30.00	30.00
TOTAL	7218.45	7267.65	7310.08	7349.00
GROSS INCOME	3630.08	3669.95	3746.08	7349.00
NET INCOME	-3588.37	-3597.7	-3564.00	-3614.85
ROI%	-49.71	-49.50	-48.75	-50.81

