Bamboo Leaves as Chicken Feed and Fodder

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Abstract

Feeding chickens on an organic diet containing fresh bamboo leaves results in increase in body weight by as much as 70% more than those fed on standard organic diets. The results suggest that the fiber in the bamboo leaves enlarges the digestive tract and enables the chickens to consume more and to grow faster.

One-day-old organic chicks were sourced from a certified supplier and split into two test and two control batches that were treated as follows.

1. The two control batches were fed a standard organic diet of fermented vegetables, corn (Zea mays), *muscovado* (locally produced unrefined brown sugar from sugarcane) and fermented fish.

2. The five test batches were fed a standard organic diet of fermented vegetables, corn, muscovado and fermented fish, with bamboo leaves added.

Young bamboo leaves were harvested by hand on a daily basis to ensure freshness, from a widely-grown Bambusa species known locally as *bayog* (Bambusa sp1). If supplies of *bayog* were not readily available, another commonly-growing species, *kawayangtinik*(Bambusablumeana), was substituted. The bamboos grow naturally within the chicken farm itself and are not cultivated, and hence organic. The leaves were chopped very finely and mixed into the standard chick feed from day one to day seven. For the older chickens (days eight and onwards), fresh bamboo leaves were made available for them to peck at; the leafy branches were pruned from the bamboos and placed on the ground throughout the ranging area.

The data on weights of the chickens throughout the 60 days growing period shows huge improvement in the weights of the chickens fed on bamboo. Chicken in the experimental group were 70% heavier than the chickens in the control group by the fifty-sixth day.

Theme: Food and Pharmaceuticals

I. Introduction

The Bambu Organic Natural Farm was set up in March 2010 as an advocacy for health and for bamboo promotion. As such, it was an integrated farm with components on Poultry Raising, Training cum Production Center for Bamboo, Loom-weaving, Natural Dye and Fruit Trees Plantation.

The poultry production component of the farm is small and may be considered as just a backyard farm as form of advocacy for health improvement and learning. The chicken farm raises organic free range sasso (grimaudfrères)chicken from the Grimaud Company of Roussay, France .

The chickens are raised free range in a fenced in lawn to protect them from predators, and provide area they can freely roam in the open-air during the daylight hours. The ground cover of the range is vegetation palatable to the chickens so that they can graze. The stocking rate is 1.5 birds per 10 square meters.

The chickens are also fed with organic feeds. Organic feed is prepared from locally available fodder materials, and composed of the following formulation:

Rice bran	20 kgs
Ground corn	10 kgs
Banana trunk	10 kgs
Camote (Sweet potato) leaves	20 kgs
Rice wash	10 liters
ABREX	1 liter
Muscovado (brown cane sugar)	2 kgs
Fermented fruit juice	2 cups
Fermented fish amino acids	2 cups

ABREX (Abra Extract) is a special feed conditioning substance, prepared locally. The preparation consistof:

A. IMO (Indigenous Micro Organism) – Cook 2.5 kg.organic rice. Place the organic rice inside a bamboo internode. Cover with manila paper and plastic sheet, tied firmly. Place in a 10" hole dug in a virgin soil and leave for 7 days. Properly prepared material should not have any black molds and ready to be removed and used at the end of the period.

B. NEM (Nature Effective Microorganism) – Remove rice from cylinder. Use equal weight of IMO and rough brown cane sugar (*muscovado*) and place in a plastic gallon. Let ferment for 28 days.

The chicken variety raised in the farm and the method they were raised were chosen for market niche. Poultry meat were mostly sold in Manila, supplied to special outlets.

It is in this context that the chicken farm started experimenting with adding bamboo as fodder for the organically raised chicken in search of ways of reducing production cost and making more productive return on investment in the poultry farm.

Limitations of the study:

The study conducted is limited in the following ways:

1. Only conducted on this chicken which is GRIMAUD FRERES (parent stocks imported from Roussay, France), by Free Range Aimee, the supplier for day-old chicks of Bambu Organic Natural Farm poultry component. The testing was not conducted for other species/varieties of fowls.

2. Only a comparative study between experimental and control groups were done. The variables of the study have been limited because of many constraints.

3. The poultry is just a backyard farm and not a large scale production unit. It is more a venture in an advocacy - for health improvement and for learning with limited production capacity, rather than a large-scale production unit.

II. Methodology

This simple study made use of experimental method with simple control and experimental batches to determine the effect of addition of bamboo fodder as additional food supplement to chicken raising. The experiment was conducted over a two-month period from March to May. The setup was started in March 29, 2011. The first weighing was done on April 5, 2011 and the last on May 25, 2011.

One-day-old organic chicks were sourced from a certified supplier and were split into two control batches and five test batches of 50 chicks each for a total of 350 heads.

The two control batches were fed a standard organic diet of fermented vegetables, corn (Zea mays, yellow or white variety depending on availability), *muscado*(raw brown sugar cane sugar locally produced) sugar, andfermented fish.

The test batches were fed standard organic diet of fermentedvegetables, corn, *muscovado sugar*, and fermented fish, with bamboo leaves added as fodder. Bamboo leaves used were of the local *bayog*(used to be known as Dendrocalamusmerillanus but was reclassified to Bambusa sp1 due to finding of a study by Elizabeth Widajaia). An alternate specie used is the *kawayangtinik* (Bambusablumeana). Young bamboo leaves with small branches were harvested by hand on a daily basis to ensure freshness. From day 2 to day 8, finely chopped bamboo leaves (from ¼ kg. to 1 kg.) with ground red rice were added to the chicken food. On the 9th day, sprigs were scattered on the range so that the birds can feed on the leaves.

The nutritional content of some locally produced leaves used as fodder is shown below (Table 1). Bamboo provides greater amount of dry matter, ether extract, crude fiber, ash, and nitrogen free extract. Sweet potato plants with green leaves, has a very slight advantage in terms of crude protein.

Table 1
Nutritional Value of Some Leaves Used for Fodder

Feed Material	Dry Matter	Crude Protein	Ether Extract	Crude Fiber	Ash	Nitrogen Free Extract
Bamboo, green variety	42.00	7.64	1.48	12.21	5.23	15.44
Bamboo, yellow variety	37.90	6.72	1.19	11.70	3.99	14.30
Sorghum (Hallepence)	18.97	2.45	4.62	6.30	2.56	7.04
Sweet potato, green leaves	29.75	8.02	0.24	3.51	2.86	15.12
Sweet potato, purple leaves	23.62	7.38	0.31	2.42	2.19	11.32
Sweet potato, vine and leaves	15.66	2.93	0.46	1.49	1.66	9.12

Source: Bureau of Animal Industry, Department of Agriculture, Diliman, Quezon City, Philippines

Chicken were weighed every seven days during the testing period, and the weights were tabulated and summarized for presentation.

III. Results, discussion and interpretation

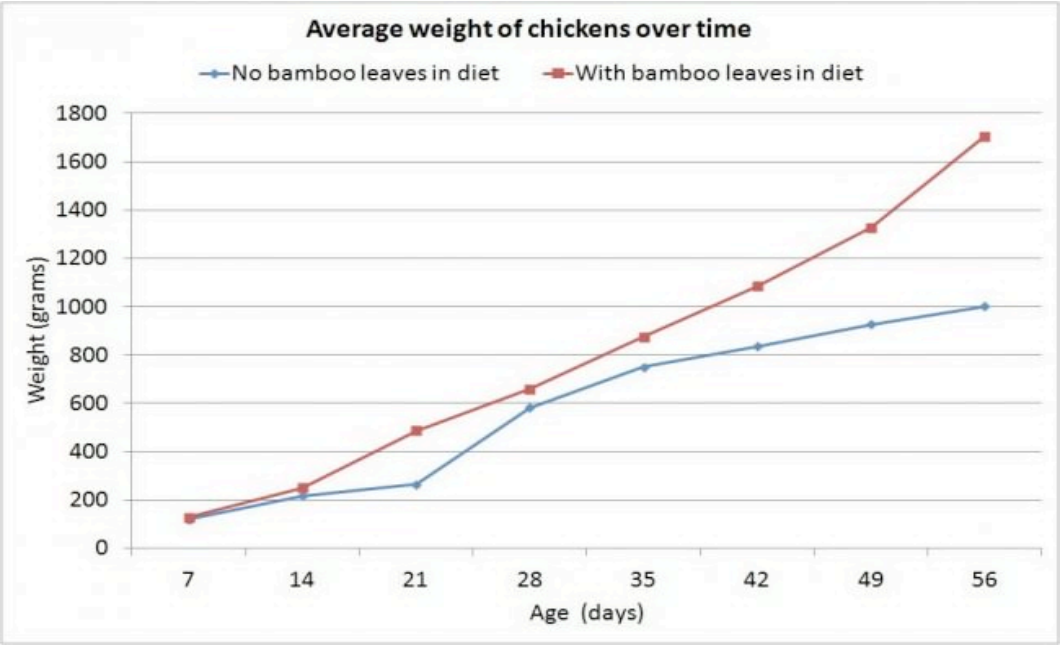
The resulting average weights of the chicken batches measured weekly is presented below (Table 2).

Table 2
The average weights of the control and experimental batches

Days	Control Group			Test Group					
	Batch1	Batch 2	Average	Batch 3	Batch 4	Batch 5	Batch 6	Batch 7	Average
7	149	152	150.5	149	150	149	149	150	149.4
14	209	212	210.5	235	242	240	238	240	239.0
21	280	281	280.5	499	505	501	495	500	500.0
28	580	579	579.5	635	640	640	643	640	639.6
35	757	763	760.0	875	881	880	883	881	880.0
42	810	812	811.0	1087	1083	1080	1076	1080	1081.2
49	935	947	941.0	1327	1335	1330	1327	1330	1329.2
56	998	1010	1004.0	1695	1698	1701	1703	1698	1699.0

The birds started day-old chicks at an average of 150 grams each. The growth rates of the chickens fed with bamboo leaves in addition to the regular organic feed show a greater weekly growth rates than the birds fed only with the organic feed formulation. The final average weight 1699 grams of the test subjects

is 68% greater than the final average weight of 1010 grams of the control group. The data is presented in the graph below.



In an attempt to find a rationale for the observed phenomenon, observations were carried on butchered chickens. The intestines were studied in another two groups of two batches of chicken of 50 heads each. The intestines of 50 chickens fed with bamboo and 50 chickens not given bamboo fodder were measured and compared. The table below (Table 3)shows the difference between the intestines of the two groups of chickens.

Table 3
Comparison of the length of intestines of chicken

Chicken fed with bamboo leaves		
Number of Heads	50	50
Live weight (Kilos)	1.44	1.56
Dressed weight (Kilos)	1.14	1.26
Length of intestines (cm)	89.20	78.33
Chicken without bamboo leaves		
Number of heads	50	50
Live weight (Kilos)	1.44	1.52
Dressed weight (Kilos)	1.14	1.22
Length of intestines (cm)	69.40	68.33

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The table shows that chicken fed with bamboo leaves tend to have longer intestines and may explain for faster metabolism and absorption of nutrients resulting to heavier weights. Moreover, it is possible, though not proven conclusively the bamboo in the diet may cause the intestines to grow longer earlier in the bird's life and cause the observed difference in the weight gain of the poultry being raised.

IV. Summary, conclusion, and recommendations

The simple experiment conducted shows that the inclusion of bamboo in the daily feeding of the chickens results in increase weight gain of the birds, by as much as 70%. This seems to be caused by lengthening of the intestine and possibly enable the birds to gain weight by better absorption of nutrients from the food ingested.

In conclusion, the use of bamboo leaves as regular food for chicken is profitable because it increases the weight gain of the birds. This will redound to better Return on investment (ROI)in the food production.

While the facts gathered in this study show the marked increase in weight of chickens, more studies should be done along these lines:

1. Determine the optimal amount of bamboo material given as fodder
2. Analysis of nutritional value of other local bamboo species
3. Analysis of nutritive content of chicken fed with bamboo leaves
4. The effects of feeding other animals with bamboo leaves

References:

Nutritional Value of Soem Leaves Used for Fodder. Bureau of Animal Industry, Department of Agriculture, Republic of the Philippines

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