BIBLIOGRAPHY

FARNIG, RONALD O. November 2010. Performance of Sunshine Chicken Given Job's Tears (*Coix-lacryma jobi)* as Feed Supplement. Benguet State University, La Trinidad, Benguet.

Adviser: Madeline S. Kingan, MSc

ABSTRACT

The study was conducted to evaluate the performance of Sunshine chicken given different levels of ground Job's Tears. Specifically, the study was conducted to determine the effect of ground Job's Tears in terms of gain in weight, feeds efficiency and feed consumption, morbidity and mortality of Sunshine chicken, the profitability of raising Sunshine chicken given Job's Tears as feed supplement.

Following the completely randomized design, the 160 Sunshine chickens were divided into four treatments. Each treatment was replicated four times with ten birds per replicate making a total of forty birds per treatment. The four treatments were T_0 (pure commercial feeds), T_1 (25g *Coix* + 1 kg commercial feeds), T_2 (50g *Coix* + 1 kg commercial feeds), and T_3 (75g *Coix* + 1 kg commercial feeds).

Results showed that there were no significant differences among the treatments in all the parameters mentioned.

Based on the results and observation it was showed that using Job's tears as feed supplement in Sunshine chicken raising is not recommended. However, it is still recommended that further studies should be made using different levels, perhaps a larger amount, because there is a possibility that the amount used in this study was too small to take effect on the experimental birds.

TABLE OF CONTENTS

INTRODUCTION

Poultry is one of the world's major and fastest growing sources of meat. In recent years, poultry farming has increased throughout the world, especially in developing countries. According to the projections for the year 2010, overall world production of poultry will increase twofold, while the increase in developing countries alone will be threefold (PCARRD and BAR, 2006).

Furthermore, livestock and poultry industries in the Philippines contributed about one third of the Gross Value Added (GVA) in Agriculture. Although poultry farming supplies the populations in large urban centers with animal proteins, it should be acknowledged that this form of farming is very expensive and depends mainly on imported inputs. This form of rearing essentially requires chicks from selected stocks and whole feeds made from raw materials which are mainly imported.

There is a need to explore the local feedstuffs in order to reduce feed costs and the dependence of local production on imports. Among the many products which could be used to develop feed for poultry is Job's tears (*Coix lacryma-jobi L*).

Job's tears are grains of tropical Asian grass, which is also referred as Job's tears in common nomenclature. These grains have number of uses, from foods to ornaments, and they appear to have been harvested and cultivated for thousands of years. Many Asian markets sell Job's tears in their grain sections for cooking. Craftspeople also use Job's tears, and they may be found at beading and craft stores for this purpose (Smith, 2009).

Job's tears is widely known probably because of its many uses. The grain is a nutritious source of food not only for man but also for animals. The berries are strung as beads for rosaries and decorative for curtains, bags, necklaces, etc. It is also believed that Job's Tears grains can cure or prevent illness like cancer and arthritis.

This study was conducted to find out the effect of Job's tears on the performance of sunshine chickens. The result of this study can serve as a guide in using Job's Tears as a supplement in sunshine chicken raising.

Lastly, this research can provide data on how to enhance the performance of sunshine chickens that can result to high net profit and income through the use of Job's tears.

Specifically, this study aimed to determine the growth rate, feed conversion ratio, morbidity, mortality and the profitability of raising sunshine chicken supplemented with Job's tears.

This study was conducted at the Poultry Experimental Project of Benguet State University, La Trinidad, Benguet from May 2010 to June 2010.

REVIEW OF LITERATURE

About Job's Tears

Job's tears is a plant growing 1-2 meters high. The stem is stout, erect and branched. The leaves are 10-40 cm long, 2.5-4 cm wide, with a broad chordate base. The spikes are 6-10 cm long, erect and peduncle. The capsules enclosing the female flowers and grains are hard, bony, white, or nearly black, shiny, ovoid and about 8 mm long. Each seed of the plant is produced individually, enclosed in a tear-shaped shell that is naturally a pale gray color. When this seed is ripe and the flower falls off, what is left is perfect natural bead with naturally occurring holes in each end. Thus the plant sometimes called the Bead Seed Plant (Smith, 2009).

Kerry (2007) stated that the presence of Job's tears in the jewelry world is probably its main claim to fame, certainly among tourists. For thousand of years, necklaces, rosaries, and musical instruments, have been made using this tear-shaped bead, most universally known as Job's tears. Wind (2009) stated that during the Vietnam war, Job's Tears was staple in the South, when supplies of rice were low.

The common name for Job's tears comes from its distinctive teardrop shape, although the tears are sometimes ascribed to different people, such as Mary, in the case of Mary's tears, Christ's tears, and so forth. The plant does not appear to have any religious significance, despite the Biblical references in its common names, although the grains are sometimes used as the beads in rosaries. The scientific name suggests that the plant was originally known as Job's tears, whatever else it might be called, since *lacryma-jobi* means "Job's Tears" (Smith, 2009).

Economic Importance of Job's Tears

According to Pink (2004), throughout Asia, the hulled grain of Job's Tears is adapted for parching or boiling like rice, it can also be milled, ground into flour and baked into bread. The grains are also utilized in soups, porridge, drinks and pastries. In India, the Nagas use the grain for brewing a beer called *zhu* or *dzu.* A Japanese variety called "Ma-Yuen" is brewed into a tea and an alcoholic beverage, and roasted seeds are made into coffee-like drink. In Korea, a thick drink called *yulmu cha* (Job's tears tea) is made from powdered Job's tears. A similar drink, called *yi mi shui*, also appears in Chinese cuisine, and is made by simmering whole polished Job's tears in water and sweetening the resulting thin, cloudy liquid with sugar. The grains are usually strained from the liquid but may also be consumed separately or together. In both Korea and China, distilled liquors are also made from the grain. One such example is the South Korean liquor called *okroju*, which is made from rice and Job's tears. In Japan, an aged vinegar is made from its grain. In Southern Vietnam, a sweet and cold soup called *sam bo luong* has Job's Tears as one of its ingredient. In Thailand, it is often consumed in teas and other drinks such as soy milk. According to Agnes Arber, the leaves are used as fodder in parts of India, and are especially relished by elephants (Armstrong, 1994).

Job's Tears as Medicine

According to Numata (1994), decoction of the Job's tears roots has been used for gonorrhea and menstrual disorders. The seeds have been used as anti-inflammatory medicine. Tincture or decoction of its seed is used for catarrhal afflictions. Tea from boiled seeds are drunk for treatment of warts. Also used for lung abscesses, appendicitis, arthritis, etc.

Nutrient Analysis of Job's Tears

A sample of the Job's tears to be used in the study was subjected to analysis of the DOST-CAR laboratory and the following nutrients were found:

PARAMETERS	ANALYSIS (per 200g of *Coix*)
Ash	11.90
Carbohydrate	69.15
Crude Fat	2.40
Crude Protein	4.90
Moisture	11.65
Energy, kcal	318.00

Source: DOST-CAR, 2010

MATERIALS AND METHODS

The materials used were 160 straight-run sunshine chicks, commercial feeds, antibiotic, vaccines, brooding-rearing cages, weighing scale, old newspapers, feeding and drinking troughs, record book, stick brooms, disinfectant, incandescent bulbs and *Coix* grains.

Methodology

Pre-experimental phase. A week before the arrival of the chicks, all equipment were cleaned and disinfected. The floor of the brooders were covered with old newspapers that helped in conserving heat during brooding period and served as feed receptacle during the first days of brooding. The 100 watt bulbs were installed as source of heat to the chicks (Figure 1).

Figure 1. The experimental birds during the first days of brooding

Upon arrival, the chicks were placed inside the brooder and were fed with chick booster feeds. Water was available to them at all times.

After 21 days (Figure 2), the experimental birds were weighed to obtain their initial weight (Figure 3) and were distributed at random into four treatments following the Completely Randomized Design (CRD). Each treatment was replicated four times with 10 birds per replication making a total of 40 birds per treatment.

The four treatments were:

T_0= Pure commercial feeds

T_1= 25g ground *Coix* + 1kg commercial feeds

T_2= 50g ground *Coix* + 1kg commercial feeds

T_3= 75g ground *Coix* + 1kg commercial feeds

Figure 2. The experimental birds at 21 days old

Figure 3. Getting the initial weight of the experimental birds

Feeding and management. All the experimental birds were subjected to the same feeding and management except the level of ground *Coix* that was given in accordance to the different treatments. The ground *Coix* was incorporated with the feeds. The birds were fed with chick booster for 20 days and was shifted to chick starter for another 20 days and then it was changed to finisher feeds for the following days until the end of the study. On the 22nd day of birds, ground *Coix* grains was incorporated with the feeds that were given to the experimental birds. Samples of the *Coix* plants and grains are shown in Figures 4 and 5.

Figure 4. Sample picture of *Coix* plants with mature grains

Figure 5. *Coix* grains being sun dried

Data Gathered

The data gathered were the following:

1. Initial weight (kg). This was the weight of the birds at 21 days old.

2. Final weight (kg). This refers to the weight of the birds at 45 days old after the experimental period (Figure 6).

3. Feed consumption of the birds (kg). This was the amount of feeds that the birds have consumed throughout the study.

4. Cost of feed (Php). This is the cost of feeds the birds have consumed throughout the study.

5. Morbidity. This was the number of the birds that got sick throughout the duration of the study.

6. Mortality. This was the number of the birds died throughout the duration of the study.

7. Production cost (Php). This includes the cost of feeds, medication, and other expenses that were used in the study.

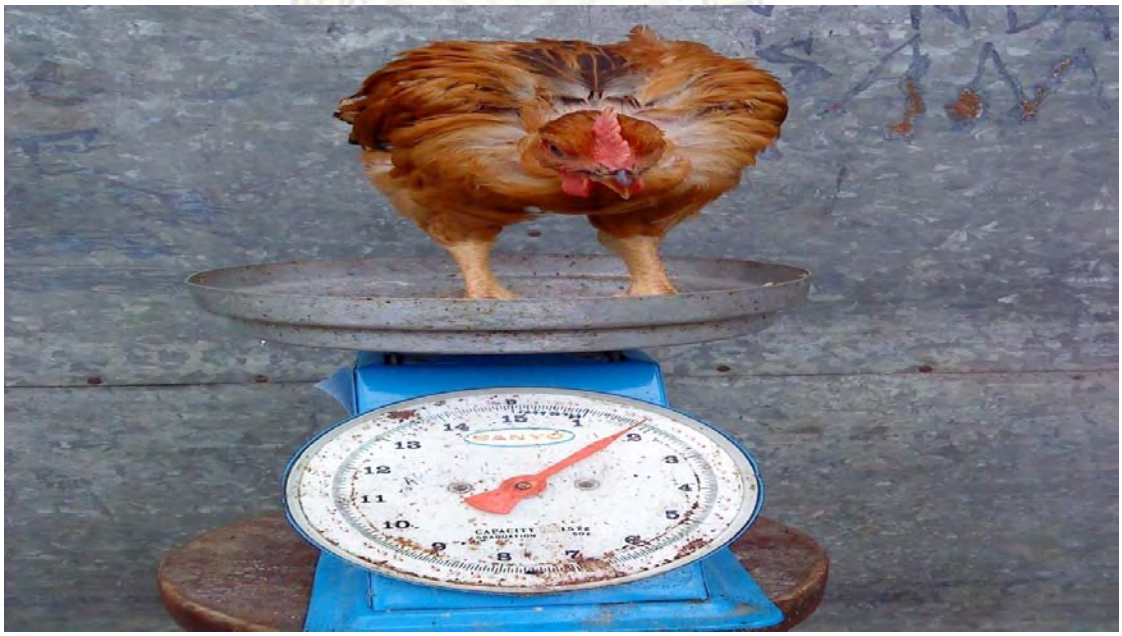

Figure 6. Getting the final weight of the experimental birds

From the data above, the following were computed:

1. Total gain in weight of the birds (kg). This was obtained by subtracting the initial weight from the final weight of the birds.

2. Feed conversion ratio. This was computed by dividing the feed intake by the gain in weight of the birds.

3. Feed consumption. This was obtained by subtracting the total feed leftover from the feed offered.

4. Mortality rate %. This was computed by dividing the number of birds died by their initial number multiplied by 100.

5. Feed cost to produce a kilogram gain in weight (Php). This was obtained by multiplying the feed cost per kilogram by the feed conversion ratio.

6. Total cost per kilogram of broiler produced (Php). This was computed by dividing the total cost of production by the total kilogram of the birds per treatment.

7. Net profit (Php). This was obtained by subtracting the total cost of production from the total sales.

8. Return on investment (ROI). This was obtained by dividing the net profit by the cost of production multiplied by 100.

Data Analysis

The data were analyzed using the analysis of variance for Completely Randomized Design and treatment means were compared using Duncans Multiple Range Test (DMRT).

RESULTS AND DISCUSSION

Initial Weight

The initial weight of the birds in the different treatments is shown in Table 1. The average initial weights were taken when the experimental birds were 21 days old. Statistical analysis revealed that there were no significant differences among the treatments. While there are slight differences in the body weights of the experimental birds as presented in the table, such difference were very minimal to cause a significant difference among the treatments. Result also implies that the experimental birds had more or less the same in weight at the start of the study. The average initial weight is 0.496 kg.

Final Weight

Table 2 presents the final weight of the experimental birds under the different treatments. The final weight of the experimental birds was obtained at the end of the study at the age of 45 days. The birds given pure commercial feeds and those birds given

Table 1. Average initial weight of the birds

TREATMENT	MEAN INITIAL WEIGHT (kg)
Pure commercial feeds	0.496[a]
25g *Coix* per kg of feeds	0.494[a]
50g *Coix* per kg of feeds	0.499[a]
75g *Coix* per kg of feeds	0.494[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

25g, 50g and 75g of ground *Coix* per kilogram of feeds had comparable final weight. This further implies that *Coix* grains incorporated with the ration of the sunshine chicken did not have an effect on the growth rate of the experimental birds.

Gain in Weight

The average gain in weight of the birds in the different treatments is shown in Table 3. Statistical analysis showed that there were no significant differences among the treatments. This implies that the gain in weight of the different treatments were more or less the same. This means that the *Coix* grains given to the birds had no effect when it comes to the growth rate of the experimental birds. Since the average gain in weight of the birds in all the treatments are the same, this means that all the experimental birds had the same ability to gain weight regardless of diet.

Table 2. Average final weight of the birds

TREATMENT	MEAN FINAL WEIGHT (kg)
Pure commercial feeds	1.57[a]
25g *Coix* kg of feeds	1.57[a]
50g *Coix* per kg of feeds	1.57[a]
75g *Coix* per kg of feeds	1.56[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

Table 3. Average gain in weight of the birds

TREATMENT	MEAN GAIN IN WEIGHT (kg)
Pure commercial feeds	1.07[a]
25g *Coix* per kg of feeds	1.07[a]
50g *Coix* per kg of feeds	1.07[a]
75g *Coix* per kg of feeds	1.07[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

Feed Consumption

The average feed consumption of the birds is shown in Table 4. Statistical analysis showed there were no significant differences among the different treatments. This means that all the experimental birds have eaten more or less the same amount of feeds. Those birds given 75g of ground *Coix* per kilogram of feeds registered numerically the highest feed consumption followed by those birds given 25g of ground *Coix* per kilogram of feeds then those birds fed pure commercial feeds and those birds given 50g of ground *Coix* per kilogram of feeds. This implies that the ground *Coix* incorporated with the ration of the experimental birds did not increase nor decrease the feed consumption of the birds. It could also mean that the acceptability of the rations were not adversely affected by the incorporation of the ground *Coix* grains.

Table 4. Average feed consumption of the birds

TREATMENT	MEAN FEED CONSUMPTION (kg)
Pure commercial feeds	2.805[a]
25g *Coix* per kg of feeds	2.812[a]
50g *Coix* per kg of feeds	2.810[a]
75g *Coix* per kg of feeds	2.827[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

Feed Conversion Ratio (FCR)

The average feed conversion ratio of the birds is shown in Table 5. Statistical analysis showed that there were no significant differences among the treatments in the amount of feeds to produce a unit gain in weight in Sunshine chicken. This implies that the FCR of the different treatments are more or less the same. Results revealed that as the amount of ground *Coix* incorporated into the ration of the experimental is increased the FCR also increases numerically. This indicates that the ability of the birds to convert feed to gain is decreased. However, it is not to a considerable degree. This may also show that birds fed with *Coix* grains can be as efficient as those fed pure commercial feeds.

Table 5. Average feed conversion ratio of the birds (FCR)

TREATMENT	FCR
Pure commercial feeds	2.62[a]
25g *Coix* per kg of feeds	2.63[a]
50g *Coix* per kg of feeds	2.63[a]
75g *Coix* per kg of feeds	2.65[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

Feed Cost to Produce a Kg Gain in Weight (Php)

Table 6 shows the feed cost to produce a kilogram gain in weight. Statistical analysis revealed there were no significant differences among the different treatments. This implies that the cost to produce a kg gain in weight of the birds are more or less the same.

Mortality and Morbidity Rate of the Birds

Out of the 160 birds that were used in the study three birds have died, however, this was during the pre-experimental phase and these were replaced immediately with the birds of the same age. During the feeding of the experimental ration, there were no experimental birds that died nor got sick.

Net Returns

The net returns and return on investment is shown in Table 9. Those birds given pure commercial feeds had the highest ROI followed by those birds given 50g of ground *Coix* per kilogram of feeds and those birds given 25g of ground *Coix* per kilogram of feeds and lastly those birds given 75g of ground *Coix* per kilogram of feeds.

Table 6. Feed cost to produce a kg gain in weight

TREATMENT	FEED COST TO PRODUCE A KILOGRAM GAIN IN WEIGHT (Php)
Pure commercial feeds	64.85[a]
25g *Coix* per kg of feeds	65.16[a]
50g *Coix* per kg of feeds	65.16[a]
75g *Coix* per kg of feeds	65.66[a]

Means with the same superscript are not significantly different at P<0.05 DMRT

Table 7. Return on investment and net returns

TREATMENT	GROSS RETURN	TOTAL COST OF PRODUCTION	NET INCOME	ROI (%)
Pure commercial feeds	8,494.50	5,765.80	2,728.70	47.33
25g *Coix* per kg of feeds	8,459.50	5,857.52	2,601.98	44.42
50g *Coix* per kg of feeds	8,444.25	5,937.97	2,506.28	42.21
75g *Coix* per kg of feeds	8,356.50	6,043.59	2,312.91	38.27

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

Results of the study revealed that there were no significant differences among the treatments in all the parameters gathered in terms of initial weight, final weight, gain in weight, feed consumption, feed conversion ratio, and feed cost to produce a kilogram gain in weight. The results also imply that the ground *Coix* incorporated with the ration of the experimental birds had more or less no effect on the performance of the Sunshine Chickens.

Regarding the percentage of mortality and morbidity. Out of the 160 experimental birds that were used, none had died nor got sick throughout the duration of the study.

On the net returns and return on investment (ROI), those birds given with pure commercial feeds has the highest ROI followed by those birds given with 25g of ground *Coix* per kilogram of feeds which has an ROI of 49.55 then those birds given with 50g of ground *Coix* per kilogram of feeds and those birds given with 75g of ground *Coix* per kilogram of feeds which has an ROI of 48.98 and 47.02 respectively.

Conclusion

Based on the results and observations, it is concluded that using Job's Tears as supplement for Sunshine chicken did not show any effect on all the parameters on this study. The data gathered were homogenous for all treatments considered.

Recommendation

Based on the findings on this study, it is therefore not recommended to use Job's Tears as feed supplement in sunshine chicken raising. However, it is still recommended that further studies should be made using different levels, perhaps a larger amount, because there is a possibility that the amount used in this study was too small to take effect on the experimental birds. Moreover, further studies should be encouraged to know the effect of Job's Tears as a medicine to animals including Sunshine Chickens.

LITERATURE CITED

ARMSTRONG, W. P. 1994. "Job's Tears: Ornament. Vol. 16, No. 17. Pp 104-105.

DEPARTMENT OF SCIENCE AND TECHNOLOGY. 2010. Chemical Analysis of *Coix* Grains

KERRY, A. 2007 Job's Tears: Kerry's Island Kitchen. Gabriola Island, B.C., Canada. Retrieved February 2010 from http://www.islandfoodie.com/jobs%20tears.htm

NUMATA, M. 1994. Antitumor components isolated from the Chinese herbal medicine *Coix lacryma-jobi*. Vol. 60, No. 4. Pp 356-359. Retrieved February 2010 from http://www.jstor.org/stable/4252082

PHILIPPINE COUNCIL FOR AGRICULTURE FORESTRY AND NATURAL RESOURCES RESEARCH AND DEVELOPMENT and BUREAU OF AGRICULTURAL RESEARCH. 2006. The Philippine Recommends for Broiler Production: Fourth Edition. Pp 15-21

PINK, A. 2004. Gardening for the Million. Project Gutenberg Literary Archive Foundation. Retrieved February 2010 from http://www.gutenberg.org/etext/11892

REIMAR, G. and SCHAAFFHAUSEN, S. 2000. Adlay or Job's Tears: a Cereal of Potentially Greater Economic Importance. Vol. 6, No. 3. Pp 216-227

SMITH, S. E. 2009. What are Job's Tears (*Coix lacryma-jobi)*. Vol. 10, No. 4. Pp 25-29.

TAYLOR, G. 1953. Some Crop Distribution by Tribes in Upland Southeast Asia; Southwestern Journal of Anthropology, Vol. 9, No. 3.

THAILAND DEPARTMENT OF AGRICULTURE. 2006. "Job's Tears". Retrieved February 2010 from www.doa.go.th

WIND, D. 2009. Job's Tears-Fascinating plant. Retrieved February 2010 from http://davesgarden.com/guides/articles/view/1714/

APPENDICES

Appendix Table 1. Average initial weight of the birds (kg)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	0.495	0.497	0.495	0.498	1.985	0.496
25g *Coix*/kg of feeds	0.495	0.494	0.496	0.492	1.977	0.494
50g *Coix*/kg of feeds	0.496	0.500	0.500	0.499	1.995	0.499
75g *Coix*/kg of feeds	0.492	0.497	0.493	0.495	1.977	0.494
GRAND TOTAL					7.934	
GRAND MEAN						0.496

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	0.000055	0.000018	0.00006^{ns}	3.49	5.95
Error	12	3.934313	0.327859			
TOTAL						

ns= not significant Coefficient of variation= 1.15%

Appendix Table 2. Average final weight of the birds (kg)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	1.59	1.59	1.54	1.56	6.28	1.57
25g *Coix*/kg of feeds	1.60	1.58	1.52	1.56	6.26	1.57
50g *Coix*/kg of feeds	1.57	1.58	1.54	1.58	6.27	1.57
75g *Coix*/kg of feeds	1.54	1.55	1.57	1.59	6.25	1.56
GRAND TOTAL					25.06	
GRAND MEAN						1.57

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	0.000125	0.00004167	0.06^{ns}	3.49	5.95
Error	12	0.00785	0.00004167			
TOTAL	15					

ns= not significant Coefficient of variation= 1.63%

Appendix Table 3. Average gain in weight of the birds (kg)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	1.095	1.093	1.045	1.062	4.295	1.07
25g *Coix*/kg of feeds	1.105	1.086	1.024	1.068	4.283	1.07
50g *Coix*/kg of feeds	1.074	1.080	1.040	1.081	4.275	1.07
75g *Coix*/kg of feeds	1.048	1.053	1.077	1.095	4.273	1.07
GRAND TOTAL					17.127	
GRAND MEAN						4.28

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	0.002063	0.00068767	1.04^{ns}	3.49	5.95
Error	12	0.007951	0.00066258			
TOTAL	15					

ns= not significant Coefficient of variation= 0.6%

Appendix Table 4. Average feed consumption of the birds (kg)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	2.798	2.801	2.812	2.809	11.22	2.805
25g *Coix*/kg of feeds	2.840	2.779	2.817	2.812	11.24	2.812
50g *Coix*/kg of feeds	2.805	2.856	2.790	2.790	11.24	2.810
75g *Coix*/kg of feeds	2.817	2.845	2. 821	2.823	11.31	2.827
GRAND TOTAL					45.01	
GRAND MEAN						2.814

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	0.0011687	0.00038957	0.001^{ns}	3.49	5.95
Error	12	4.910417	0.4092			
TOTAL	15					

ns= not significant Coefficient of variation= 1.1%

Appendix Table 5. Average feed conversion ratio of the birds (FCR)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	2.56	2.56	2.69	2.65	10.46	2.62
25g *Coix*/kg of feeds	2.57	2.56	2.75	2.63	10.51	2.63
50g *Coix*/kg of feeds	2.61	2.64	2.68	2.58	10.51	2.63
75g *Coix*/kg of feeds	2.69	2.70	2.62	2.58	10.59	2.65
GRAND TOTAL					42.07	
GRAND MEAN						2.63

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	0.0021687	0.0007229	0.17^{ns}	3.49	5.95
Error	12	0.051125	0.00426042			
TOTAL	15					

ns= not significant Coefficient of variation= 2.48%

Appendix Table 6. Feed cost to produce a kilogram gain in weight (Php)

TREATMENT	REPLICATIONS				TOTAL	MEAN
	I	II	III	IV		
Pure commercial feeds	63.49	63.49	66.71	65.72	259.41	64.85
25g *Coix*/kg of feeds	63.74	63.49	68.20	65.22	260.65	65.16
50g *Coix*/kg of feeds	64.73	65.47	66.46	63.98	260.64	65.16
75g *Coix*/kg of feeds	66.71	66.96	64.98	63.98	262.63	65.66
GRAND TOTAL					1043.33	
GRAND MEAN						65.21

ANALYSIS OF VARIANCE

SOURCE OF VARIATION	DEGREES OF FREEDOM	SUM OF SQUARES	MEAN OF SQUARES	COMPUTED F	TABULATED F	
					0.05	0.01
Treatment	3	1.331215	0.44374	0.17^{ns}	3.49	5.95
Error	12	31.406825	2.617235			
TOTAL	15					

ns= not significant Coefficient of variation= 2.48%

Appendix Table 7. Return On Investment

ITEM	T_0	T_1	T_2	T_3
A. Sales				
1. Sunshine Chickens	8,494.50	8,459.50	8,444.25	8,356.50
TOTAL SALES	8,494.50	8,459.50	8,444.25	8,356.50
B. Expenses				
1. Cost of stock	1, 800.00	1,800.00	1,800.00	1,800.00
2. Cost of feeds	3,623.30	3,630.72	3,628.87	3,646.09
3. Cost of *Coix* grains	0.00	84.30	168.60	254.40
4. Medication	121.25	121.25	121.25	121.25
5. Bulbs	150.00	150.00	150.00	150.00
6. Disinfectant	71.25	71.25	71.25	71.25
TOTAL EXPENSES	5,765.80	5,857.52	5,937.97	6,043.59
C. Net Income	2,728.70	2,601.98	2,506.28	2,312.91
ROI (%)	47.33	44.42	42.21	38.27

Appendix Table 8. Nutrient analysis of Job's tears

Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
Regional Office No. Cordillera Administrative Region
Regional Standards and Testing Laboratory

PAO ACCREDITED TESTING LABORATORY

REPORT OF ANALYSIS

Agency TSR No. : 2010-1070-C
Date Submitted : September 15, 2010
Date Analyzed : September 16-17, 2010
Date Reported : September 17, 2010
Submitted by : Customer Name : Ronald O. Farnig
Company : BENGUET STATE UNIVERSITY
Address : La Trinidad, Benguet
Page : Page 1 of 1

SAMPLE CODE	SAMPLE DESCRIPTION	TEST	RESULT
1070-C	Dried, ground Job's tears (*Coix lacryma-jobi*) (200 g), in plastic bag, without label	Ash, % w/w	11.90
		Carbohydrate, % w/w	69.15
		Crude Fat, % w/w	2.40
		Crude Protein, % w/w	4.90
		Moisture, % w/w	11.65
		Energy, kcal	318

METHODOLOGY

Ash. Gravimetric Method (Official Methods of Analysis of AOAC International. 18th edition. 2005. Official Method No. 942.05).
Carbohydrate. Calculation (The Philippine Food Composition Tables, FNRI, DOST Handbook. 1997).
Crude Fat. Soxhlet extraction (Official Methods of Analysis of AOAC International.18th edition. 2005. Official Method No. 920.39 and in accordance with Foss Tecator Application Notes, AN 310, Foss Analytical AB 2003).
Crude Protein. Kjeldahl method (Official Methods of Analysis of AOAC International.18th edition. 2005. Official Method No. 981.10 and in accordance with the 2000 Digestion System and Kjeltec 1002 Distilling Unit Instruction Manual).
Moisture. Oven Method (Official Methods of Analysis of AOAC International.18th edition. 2005. Official Method No. 934.01)
Energy. Calculation (The Philippine Food Composition Tables, FNRI, DOST Handbook. 1997).

REMARKS

The results given in this report are those obtained at the time of test and refer only to the particular sample submitted. This report shall not be reproduced except in full, without the written approval of the laboratory.
% w/w – percent by weight

Analyzed by:
JASMIN A. LEE-DONAAL
Approved PAO Signatory
Chemist License No. 8236

Confirmed by:
ZENAIDA JUAN BAUCAS
Approved PAO Signatory
Quality Manager

Approved for Release:
ZENAIDA JUAN BAUCAS
Quality Manager

Note: Not valid without DOST-CAR seal

Address: Km.6, La Trinidad, Benguet 2601
Tel. No. (63)(074)422-0979
Fax No. (63)(074)422-2214
e-mail address rsticar@yahoo.com
URL: http://car.dost.gov.ph