

Growth Performance of Fattening Hogs Fed With Fresh and Dried Cashew Apple

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Abstract. Cashew apples are commonly seen as leftover fruit part, after harvesting its nuts. The aim of the study included the use of locally available feed ingredients that is still left unutilized for animal consumption. The objective is to determine and compare the growth performance of hogs fed with dried and fresh cashew apple. Likewise the cost of production was also computed and compared. The result showed that fattening hogs fed with 20% fresh cashew apple and 20% dried cashew apple had heavier final weight and average bi-weekly gain in weight compared with those in the control group. The cost of production of fattening hogs fed with fresh and dried cashew apple was reduced. The result obtained will serve as baseline information to livestock growers to minimize the cost of production, thereby utilizing locally feedstuffs. For researchers this will serve as source of related studies to further increase the percentage of fresh and dried cashew apple in the ration for hogs and other animals without compromising animal's health.

Keywords: Fresh cashew apple, dried cashew apple, growth of fattening hogs, feed conversion efficiency and cost of production.

1. Introduction

Pork is the most popular source of animal protein in Filipino diet and other Christian countries. Hogs are good converters of feed. However feed represents about 60 to 80 percent of the total cost in fattening hogs (ITCPH 2005). Feed cost can be less expensive if feedstuffs that are abundant in the locality could be used. Cashew (*Anacardium occidentale*) locally known as “kasoy” is abundant in tropical areas like the province of Palawan in the Western part of Philippines, during the months of February to June. The nut is very famous as staple food and as additional flavor in pastries. However, after harvesting the nuts, the apple is unutilized and kept rotten in the field. This apple has high nutritive value and could be used as feed ingredient in animal ration. Fresh Cashew apple contains 86.90% dry matter, 7.76% crude protein, 3.9% ether extract, 6.65% crude fiber, 3.62% ash and 64% nitrogen free extract. Its dried apple contains 85.53% dry matter, 8.62% crude protein, 5.86% crude fiber, 5.86% ether extract, 7.93% crude fiber, 2.71% ash and 60.41% nitrogen free extract. (Castillo and Gerpacio, 2005).

2. Materials, Methods and Findings

2.1. Materials and Methods

This research employed experimental method Nine-two-month old weanlings (crossbreed of Landrace & Large white) all males from the same litter were used as experimental animals. Three pens were used for three months fattening period. Each pen has a dimension of three meters by three meters.

Three fattening hogs were assigned in the control group (no cashew apple in their diet), another 3 hogs were assigned in treatment 2 (with 20% fresh cashew apple in the diet) and last three hogs were assigned in

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treatment 3 (with 20% dried cashew apple). Fattening hogs in three treatments were fed a fatteners ration, during the three months duration of the study.

A ration containing 20% fresh cashew apple, 43% rice bran, 22% corn meal and 15% fish meal were administered to fatteners in treatment 2. Fresh cashew apples needed for the days ration were collected washed, cleaned and sliced to facilitate easier digestion. A ration containing 20% dried cashew apple, 43% rice bran, 22% corn meal and 15% fish meal was administered to fattening hogs in treatment 3. Cashew apples were collected and sundried for three days and grounded in the hammer mill and mixed with the other feed ingredients.

Proper care and management was administered in the entire duration of the study, such as sufficient water and feeds were given. Cleaning of the pen including the feeding troughs were done twice a day.

Data needed in the study were gathered. This includes the initial weight of the weanlings, average bi-weekly gain in weight of the fatteners, final weight of the fatteners, feed conversion efficiency per treatment and cost of production per treatment. Feed conversion efficiency (F.C.E) was computed by dividing the total feed consumed per treatment over its mean weight of fatteners per treatment. The cost of production per treatment was computed by subtracting the total expenses from the sales of the fatteners after the three months duration of the study.

3. Results

3.1. Initial Weight of the weanlings

The initial weights of the weanlings, per treatment were taken. Weanlings in Treatment 1 (control) had a mean weight of 9.07 kilograms. Weanlings in treatment 2 (fed with 20% fresh cashew apple) had a mean weight of 9.47 kilograms and those weanlings in treatment 3 (fed with 20% dried cashew apple) had a mean weight of 10.87. Analysis of variance was employed to determine degree of significance. These differences were however, statistically insignificant.

Table 1. Initial weight of the weanlings

Treatment	Weanling number			Total	mean
	1	2	3		
1 (control)	11.6	8.2	7.4	27.2	9.07
2 (20% FCA)	6	11.8	10.6	28.4	9.47
3 (20% DCA)	12.6	10	10	32.6	10.87
TOTAL				88.2	
					9.8

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.16	2	2.08	0.397959	0.688191	5.143253
Within Groups	31.36	6	5.226667			
Total	35.52	8				

3.2. Bi-weekly weight gain of the fatteners

Fatteners in treatment 2 (fed with 20% fresh cashew apple) had the highest average bi-weekly-gain in weight with 5.29 kilogram. Treatment 3 (fed with 20% dried cashew apple) follows, with an average bi-weekly gain of 4.94 kilograms. Fatteners in treatment 1 (control) had the lowest with 4.21 kilograms bi-weekly gain in weight. Statistical analysis showed no significant differences among the result of the treatments. Arganoza in 2002, reported that pig gain from .3 to .5 kilograms of weight per day or 4.2 to 7 kilograms in two weeks. Armah 2011 concluded that up to 100 g dried cashew pulp kg-1 diet had a positive effect on pig growth performance and that partial replacement of energy sources such as maize and wheat bran with dried cashew pulp is possible. Fanimo et al., (2003) claimed in their study on feeding rabbits with cashew apples that, growth performance, nutrient digestibility and carcass characteristic of growing rabbits fed with cashew apple waste were higher than the growth rates rabbits fed with conventional diets.

Table 2. Bi-weekly weight gain of the fatteners

Treatment	Fattener number			Total	mean
	1	2	3		
1 (control)	4.53	4.2	3.9	12.63	4.21
2 (20% FCA)	5.57	4.67	5.64	15.88	5.29
3 (20% DCA)	4.74	5.64	4.43	14.81	4.94
TOTAL				43.32	
					4.81

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1.828867	2	0.914433	3.485916	0.098958	5.143253
Within Groups	1.573933	6	0.262322			
Total	3.4028	8				

3.3. Final weight of the fatteners

Fatteners in Treatment 3 (fed with 20% dried cashew apple) had the highest final mean weight of 80 kilograms, followed by fatteners in treatment 2 (fed with 20% fresh cashew apple) with 79 kilogram. Fatteners in treatment 1 (control) had the lowest with 68 kilograms final mean weight. Statistical analysis showed no significant differences among the result of the treatments. PCARRD (2003) stated that fattened pigs ideally weigh about 60 kilograms to as much as 90 kilograms. A study of Armah in 2011 showed that, final live weights for pig's diets containing 0, 50, 100 and 150 g dried cashew pulp kg-1, is higher than pigs fed with conventional diet. Sundaram R (2012) suggested that cashew apple waste can be incorporated in dairy cattle feed at 10% level without any adverse influence on milk production.

3.4. Feed conversion efficiency

Feed conversion efficiency is the amount of feed needed by the animal to convert it to a kilo of meat. Least feed cost can be attained if the feed conversion efficiency is lower. Fatteners in treatment 2 (fed with 20% fresh cashew apple) were better converters (with 3.405 F.C.E), followed by fatteners in treatment 3 (fed with 20% dried cashew apple) with 3.409 F.C.E and treatment 1 (control) with 3.994 F.C.E. Arganoza (2002) reported that scientific experiments have shown that

Table 3. Final weight of the fatteners

Treatment	Fattener number			Total	mean
	1	2	3		
1 (control)	75	67	62	204	68
2 (20% FCA)	84	77	75	236	79
3 (20% DCA)	79	89	72	240	80
TOTAL				680	
					75.56

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	259.5556	2	129.7778	2.814458	0.137352	5.143253
Within Groups	276.6667	6	46.11111			
Total	536.2222	8				

adding succulent feeds to rations relishes for farm animals inducing them to eat more feeds and converting economically into useful products. The beneficial laxative effects of succulent feeds aid in keeping the animal healthy and may also stimulate digestion because of their palatability. *Samala* (1984) as cited by PCARRD (2003) revealed that one feed when fed alone to pigs, poor results are obtained. But when given in combination with other kind of feed gave better results. This is due to the supplementary effect of feed over another.

Table 4. Average Feed conversion Efficiency per treatment

TREATMENT	Average weight gain	Average Feed consumption	Feed conversion ratio/efficiency
1	58.93	235.50	3.994
2	69.20	235.50	3.405
3	69.13	235.50	3.409

3.5. Cost and return analysis

Higher net income was obtained from treatment 3 (fatteners fed with 20% dried cashew apple), followed by fatteners fed with 20% fresh cashew apple. Least net income was obtained from treatment 1 control. Feed cost per diet decreased by incorporating dried cashew apple in the ration. Same findings was reported by Armah in 2008. The cost of feed to produce a kg weight gain was lowest for the diet containing the 100 g dried cashew pulp kg-1. Adebowale B.A., Olubamiwa O., and Ogunjobi M. (2011) in their study on substitution value of sundried cashew apple bagasse in the diets of *Clarias gariepinus* stated that “the idea of substituting agro wastes for conventional feedstuffs increase profitability of converting erstwhile waste agricultural by-products to alternative feedstuff. A good economic return is possible if this cashew waste can be processed into fish diet (particularly for fingerling and juvenile production).”

3.6. Conclusion and Recommendations

The result of this study showed that fresh cashew apple and dried cashew apple can be fed to hogs from 20% in the ration. The cost of production is reduced by using either fresh or dried cashew apple mixed with other feed ingredients in the ration for fattening hogs. However the researchers would like to recommend a follow-up study on increasing the percentage of cashew apple in the ration for fattening hogs to obtain a significant result and yet would not harm the health of the animals. Also the use of cashew apples as feed ingredients to other animals. An in-depth study should be conducted to determine the quality of carcass and the backfat thickness of hogs fed with dried and fresh cashew apple.

Table 5: Cost and return analysis per treatment

A. Cost of Production	Treatment 1	Treatment 2	Treatment 3
1. stock	PhP2,040	PhP2,130	PhP2,445
2. feedstuffs	3,703.83	2918.29	3,025.19
3. medicine	79.00	79.00	79.00
4. labor	284.50	284.50	284.50
5. depreciation of housing	200	200.00	200.00
6. milling fee	220.75	136.00	176.00
TOTAL EXPENSES	PhP6,593.58	PhP5,801.79	PhP6,265.57
B. RETURN			
Sales from fatteners	PhP8,568.00	PhP9,912.04	PhP10,568.00
Net Income/treatment	PhP1,984.42	PhP4,110.25	PhP4,302.43

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