

BIBLIOGRAPHY

HIGINO, CRISTINE W., APRIL 2013, “Effect of Supplementin Commercial Ration with Azolla and Sweet Potato Leaves (*Ipomeoa batatas*) on the Carcass Characteristics of Swine”. Benguet State University, La Trinidad,Benguet.

Adviser: Marlene B. Atinyao, PhD

ABSTRACT

This study intended to determine the effect of sweet potato leaves and azolla as feed supplement on the carcass characteristics of swine and, to determine the effect of azolla and sweet potato leaves on the back fat thickness, dressing percentage, percent abdominal fat, percent wholesale cuts, and edible entrails, loin eye area, and carcass length of swine.

A total of nine (9) pigs of the same breed from two litters until they attained a liveweight of approximately 65 kg were fed the following dietary treatments: commercial feeds, commercial feeds plus azolla and commercial feeds plus sweet potato.

The findings reveal that there were no significant differences in the dressing percentage, percent abdominal fat, back fat thickness, percent edible entrails, loin eye area, and carcass length of swine among the treatments studied. The average dressing percentage of approximately 65.89 kg of hogs was 66.76 %. The wholesale cuts expressed as percent of slaughter weight were the following: 17.40% shoulder, 20.70% ham, 10.31 % loin, and 15.40% belly. While the average weight of edible entrails expressed as percent of slaughter



weight was 6.20 %. The average of carcass length and back fat thickness, were 81.84 cm and 1.88 cm, respectively.

It was concluded that commercial feeds + azolla and commercial feeds + sweet potato leaves have the same effect on the different characteristics.



INTRODUCTION

An animal carcass has three main constituents: muscle, fat, and bone. All three increase in total amount as growth occurs. However, as one tissue comprises higher percentage of the carcass, the other proportion less. As an animal grows older and longer, the proportion of the bone and muscle tissue decreases while the percent of the fat of the carcass increases. The proportion of the muscle and the bone is high (Acker, 1983).

Pig carcasses may be divided in many different ways, consistent with the huge variety of bone in joints and bone out products that come from the pig. Although it is characteristics of the pig carcass that the value of the cuts does not differ according to the position in the body nearly to the same extent as for beef and lamb, because of a lesser tenderness gradient, the most valuable parts are nevertheless the loin and ham (Whittemore, 1998).

The carcass weight of the pig is usually between 70% and 80% of its live weight. The loss is mostly blood and internal organs. The carcass weight of the pig conventionally includes the head, feet, tail, and the skin (Whittemore, 1998).

Growth as evidenced by increase in weight of the body and its parts occurs as the animal ages and as it is given food to provide the necessary nutrients that will support growth. In swine production, the most popular feed are commercially formulated rations, however, due to high cost of feeds, backyard raisers often resort to using other non-conventional feedstuffs that are available. Among these are azolla (*Azolla filliculoids*) and sweet potato leaves (*Ipomoea batatas*). Azolla is a good source of minerals and essential amino acids. It has high lignin and fiber content resulting in low digestibility. However, it is a good source of essential trace mineral for pig ration and has high protein content.



Camote leaves also one of the trace mineral for pig rations because of high fiber content and polyphenolics. On the other hand, sweet potato leaves has a high nutritional value considering its fiber content, complex carbohydrates, proteins, vitamin A and C, iron and calcium. It is also an excellent source of anti-oxidative compounds, mainly polyphenolics, which may protect the human body from oxidative stress that is associated with many diseases (Fuzhou and Purseglove, 1989).

Information from this study may be used by swine raisers, students, meat processors, and consumers as one reference in coming up with other related studies.

With a minimum capital, swine raisers can hardly cope with the increasing price of commercial feed. It is therefore, necessary to try feed supplements that can be added to the ration which may improve the performance of growing pigs and to maximize profit.

This study aims to determine the effect of sweet potato leaves and azolla as feed supplement on the carcass characteristics of swine and, to determine the effect of azolla and sweet potato leaves on the back fat thickness, dressing percentage, percent abdominal fat, percent wholesale cuts, and edible entrails, loin eye area, and carcass length of swine.

This study was conducted last September to October 2012 at Taloy, Poyopoy Sur, Tuba, Benguet.



REVIEW OF LITERATURE

Meat Yield is affected by many factors including breed stage of maturity and nutrition among others. Differences in production systems also affect meat yield but Schemes production must satisfy further criteria in relation to production environment, which must be both sustainable and ethical. (Whittemore, 1998)

Protein is the most important nutrient in the meat and most of the protein in the carcass is present in the muscle tissue. Therefore, the meat Animal Industry expends effort to maximize the protein content of the carcasses (Acker, 1983).

The changes of muscle in the live animal give the lean meat of the carcass are initiated by anaerobic glycolysis are proceeding to the post-mortem state until all of the glycogen reserves have been used. As this happens, lactic acid accumulates in the muscle but as there is no active circulatory system to remove it to the muscle increasingly acidifies until the accumulation of acid is so great that enzyme function is limited. (Lawrence and Fowler, 2002).

Body protein is found mostly in muscle which makes up the lean of the carcass. The fullness of the muscle either side of the backbone and the roundness of the ham are often much sought after as indicators of lean muscle mass. In some breeds of pigs, however roundness of the ham and fullness of the shape merely indicate fatness. Lean percentage can be measured reasonably, objectively, and directly from the depth of the fat and muscle in the middle region of the back (Whittemore, 1998).

Fat has 2.25 or more times as much as energy per pound as protein, the primary constituent of muscle. The fullness of the muscle either side of the backbone and the roundness of the ham are often much sought after as indicators of the lean muscle mass.



However, the roundness of the ham and fullness of the shape merely indicate fatness. Lean percentage can be measured reasonably, objectively, and directly from the depth of fat and muscle in the middle region of the back. Back fat on the carcass is the average of the back fat readings at the first rib and last lumbar, loin eye area is measured between the 10th and 11th ribs (Acker, 1983).

According to Acker (1983), as pig grows older and larger, the proportion of bone and muscle tissue decreases while the percent fat of the carcass increases. Fat thickness, determined by a probe or ultrasonic equipment and loin eye area, measured by ultrasonic are indicators of the proportions of muscle, fat and bone in the live animal. The larger the loin eye and less external fat, more lean.

Feed rations are compounds added to swine diets for the purpose of enhancing animal performance. These compounds may elicit a response; from the pig utilizing energy, amino acids, vitamins, and mineral requirement (Acker, 1983).

According to the Sanico and Palomar (1989), sweet potato forage could be an important resource as an animal feed. The forage contains 11-17% crude protein and its digestibility is greater than 62%. It has been reported that as supplement to low quality roughage, sweet potato leaves increases intake and rate of live weight gain of animals. It contains proteins, dietary fiber, lipid and essential minerals and nutrient such as calcium, phosphorus, magnesium, sodium, potassium, sulfur, iron, copper, zinc, manganese, aluminum, and boron. It is also source of vitamin A, thiamine riboflavin, niacin and ascorbic acid. Since sweet potato is excellent source of anti-oxidative compounds mainly polyphenolics, it protects the human body from oxidative stress that is associated with



many diseases including cancer and cardiovascular diseases. The presence of the fibers also helps in stabilizing the glucose metabolism and also preventing constipation.

National Azolla Action Program or NAAP (1989) reported that azolla contains 17.59-23.69% crude protein, 1.99-2.93% ether extract, 13.19-16.54% crude fiber and 0.46-2.77% total protein. Protein is the most important nutrient in meat and most of the most protein in the carcass is present in muscle tissue. The meat industry expends effort to maximize the protein content of carcasses.

Organoleptic Evaluation

According to FAO (2012), organoleptic evaluation consists in describing the attributes of food, in this special case of meat and meat products that can be perceived by the sense organs. The attributes to be evaluated are appearance, color, texture and consistency, smell and taste.

Appearance .This refers to the way meat looks, either as a carcass or as boneless meat cuts, has an important impact on its objective or subjective evaluation. The way the consumers or the processors check the appearance of meat is subjective. Differences will be registered in the relation of lean meat Furthermore, unfavorable influences can be detected such as unclean meat surfaces, surfaces too wet or too dry, or unattractive blood splashes on muscle tissue. Special product treatments or the kind and quality of portioning and packaging will be recognized by evaluating the appearance.

Color .This color indicates the type and stage of the treatment to which the meat has been subjected, as well as the stage of freshness. In judging meat color, some experience is needed to be able to distinguish between the color which is typical for a specific treatment or which is typical for specific freshness. Fresh meat surfaces which have been in contact with the air for only a short period turn into a bright red color because of the influence of the oxygen in the air. Changes from dark red to bright red are therefore



typical and are normal reactions of fresh meat. It has long been known that after pickling (curing) fresh meat with curing ingredients (nitrite), the meat color remains red during longer storage periods, after ripening, drying and even after intensive heat treatment. Cured products with a decreasing keeping quality can be recognized when the red color becomes pale or changes to grey or green.

Texture and consistency (tenderness and juiciness). Texture and consistency, including juiciness, are an important criterion, still neglected by many consumers, for the eating quality of meat. There is a great deal of consumer negligence in how to prepare meat. It should be cooked to become sufficiently tender, but cooking should not be too intense otherwise the meat becomes dry, hard and with no juiciness. The simple way to check the consistency of foods is by chewing. The texture is of less importance in meat products, such as cured or canned products, sausages, etc., because they are either made of comminuted meat and/or meat which has undergone heat treatment or long maturation periods and will therefore generally be tender. On the other hand, inadequate processing methods (too intensive cooking, curing, comminuting) may cause losses in the desired consistency and juiciness, and the best way to check this is by chewing.

Aroma and Taste .These characteristics are related to each other to a certain extent because they have to be evaluated together for the reliable determination of a product's flavor. The freshness of meat is generally indicated by its smell together with its appearance and color. The odor of the cooking broth and the taste of the warm meat samples will indicate whether the meat was fresh or in deterioration or subject to undesired influences. Every meat product has its typical smell and taste, and the test person should know about it. Only four basic taste components--sweet, sour, bitter and salty--will be perceived by the taste buds. These receptors are small papillae located in certain areas of the tongue. Flavor test panelists should be aware of these special cases. Panelists should not smoke or eat spicy meals before starting the test and should rinse their mouth frequently with warm water during the test. Sensory evaluation plays an important role in the

Effect of Supplementin Commercial Ration with Azolla and Sweet Potato Leaves (Ipomeoa batatas) on the Carcass Characteristics of Swine
HIGINO, CRISTINE W., APRIL 2013



examination of meat and meat products. Not only does scientific sensory evaluation with skilled panelists using special test programs and point systems give reliable results, but useful results can also be obtained in a simple way at the consumer level.



MATERIALS AND METHODS

The materials used in the study were nine heads of swine weighing 65-68 kg each, Azolla, sweet potato leaves, commercial feeds, livestock scale, measuring tape, weighing scale, knives, bolo, stunner, LPG, blow torch, lighter, chopping board, water, and basin.

Experimental Design and Treatment . The pigs were assigned at random into three treatments using the Completely Randomized Design (CRD) at the start of the growth trial which preceded this study. Each treatment was replicated three times.

The different treatments imposed starting at 2 months of age when pigs weighed 22 kg until they attained the about 65 to 68 kg live weight were as follows:

T₀- Commercial Feeds

T₁- Commercial Feeds + Azolla

T₂ – Commercial Feeds + Sweet Potato Leaves

<u>AGE IN WEEKS</u>	<u>FEED/ DAY(KG)</u>	<u>AGE IN WEEKS</u>	<u>FEED/ DAY (KG)</u>
10	1.0	18	1.8
11	1.1	19	1.9
12	1.2	20	2.0
13	1.3	21	2.1
14	1.4	22	2.2
15	1.5	23	2.3
16	1.6	24	2.4
17	1.7	25	2.5



Pigs had been fed with commercial feed twice a day at 7:00-7:30 am and 4:30-5:00 pm with commercial feed by following the feeding guide for growers as shown in the Table 1. The azolla and sweet potato leaves had been given to their respected treatment as *ad libitum* at 9:00am to 3:00 pm daily.

For the first two weeks, three kg of azolla, three kg of sweet potato and three kg of the mixture of azolla and sweet potato added to the suggested commercial feeds for growing pigs (Entrepinoy, 2009). After two weeks the amount of roughages fed was reduced to two kg due to lack of sources (of azolla and sweet potato leaves). So starting from the third week until eleventh week the pigs were fed roughages of two kg of azolla, for the second treatment to the pigs that were fed of azolla, two kg of sweet potato leaves to the third treatment to the pigs that were fed potato leaves. The fourth treatment was the combination of one kg of azolla and one kg of sweet potato.

All experimental animals were subjected to uniform slaughtering procedures. The following are the practices in slaughtering hogs (Ibarra 1983):

1. Stunning. It is the process of making the animal unconscious prior to bleeding.
2. Sticking . It is the process of bleeding the animal with the use of seven inch sticking knife. Head is held with the left hand and sticking is done on the hallow portion above the tip of breast bone (Figure 1).
3. Singeing. Application of flame to a carcass for the purpose of burning the unscraped hair and kill some microorganism. (Figure 2)





Figure 1. Sticking of the hog



Figure 2. Singeing of hog

4. Evisceration. Involves the opening of the carcass up to the complete removal of the internal organs from the body cavity.



Figure 3. Evisceration of the hog

Effect of Supplementin Commercial Ration with Azolla and Sweet Potato Leaves (Ipomeoa batatas) on the Carcass Characteristics of Swine
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5. Weighing the Carcass. It is the process of weighing the hog after slaughter excluding the entrails, head and feet.

6. Fabrication. Cutting the carcass into standard wholesale and retail cuts (Figures 4- 8).



Figure 4. Weighing the ham



Figure 5. Weighing the shoulder



Figure 6. Weighing the belly



Figure 7. Weighing the loin



Figure 8. Measuring the loin eye area



Figure 9. Measuring the carcass length

Data Gathered

1. Slaughter Weight (kg). This was obtained by weighing the animals prior to slaughter using livestock scale after 24 hours of fasting.

2. Carcass Weight (kg) . It was the weight of the carcass without head, feet, and the entrails.

3. Weight of Wholesale Cuts (kg) . These were the weight of the shoulder, ham, belly, and loin. The carcass was chopped into wholesale cuts which were weighed individually with a meat scale.

4. Dressing Percentage. This was obtained by dividing the carcass weight by the slaughter weight multiplied by 100.

5. Carcass Length (cm). This was taken by measuring from the first rib to the base of the tail on the suspended carcass in the centimeter.

6. Back fat Thickness (cm) . This was taken by cutting the loin between the tenth and eleventh rib.

Data Computed

1. Dressing Percentage .This refers to the carcass weight expressed as percent of Slaughter weight. This was taken using the formula:

$$\text{Dressing percentage} = \frac{\text{carcass weight}}{\text{Slaughter weight}} \times 100$$

2. Percent Wholesale Cuts. This refers to the wholesale cuts expressed as percent of carcass weight. This was taken using the formula:

$$\text{Percent Wholesale Cuts} = \frac{\text{Cut Weight}}{\text{Carcass Weight}} \times 100$$

3. Back fat Thickness. This were determined by computing the average of back fat measurement taken at the opposite of P₁ (First rib), P₂ (Last rib), P₃ (Lumbar vertebra).

4. Percent of Abdominal Fat. This refers to the weight of the abdominal fat as percent of slaughter weight. This was taken using the formula:



$$\text{Percent of Abdominal Fat} = \frac{\text{Weight of abdominal fat} \times 100}{\text{Carcass Weight}}$$

5. Percent Edible Entrails. This refers to the weight of the liver, heart, kidney, and empty stomach and small intestine. This was taken using the formula:

$$\text{Percent Edible Entrails} = \frac{\text{Weight of Edible entrails} \times 100}{\text{Slaughter weight}}$$

6. Return on investment. This refers to all the expenses that were used in the study. This was taken using the formula:

$$\text{Return on investment} = \frac{\text{Net Income} \times 100}{\text{Gross sale}}$$

Data Analysis

Data were analyzed using the analysis of variance for Completely Randomized Design (CRD) and treatment means were compared using the Duncan's Multiple Range Test (DMRT).



RESULTS AND DISCUSSION

The analysis and interpretation of the gathered data based on the objectives of the study is herein presented. It includes the organoleptic test evaluated by the 20 respondents and the effect of the rations given to the hogs.

Slaughter Weight, Carcass Weight and Dressing Percentage of the Hogs

The slaughter and carcass weights and the dressing percentage of the hogs under the different treatments are presented the table 1. Statistical analysis showed no significant differences in the slaughter weight and dressing percentage of the hogs. Hogs given commercial feeds + sweet potato had a slaughter and carcass weights of 66.33 kg and 44.69 kg, respectively. Hogs given commercial feed + azolla supplementation had an average slaughter and carcass weights of 66 kg and 44.48kg, respectively and hogs given commercial feeds had an average slaughter and carcass weights of 65.53 kg and 42.9 kg, respectively.

Table 1. Slaughter weight, carcass weight and dressing percentage of hogs

TREATMENT	SLAUGHTER WEIGHT (kg)	CARCASS WEIGHT (kg)	DRESSING PERCENTAGE
Commercial feeds	65.33	42.90	65.70
CF + azolla	66.00	44.48	67.20
CF + sweet potato leaves	66.33	44.69	67.37

Means are not significantly different ($P \geq 0.05$) DMRT



The average dressing percentage of hogs weighing an average of 65.89 kg was 66.77%. This is relatively higher than the dressing percentage of 69.93% from hogs with a slaughter weight of 87.80kg as reported by Ibarra (1983). The difference may be due to condition of the carcass when the carcass weight was taken. Carcass weight was taken from freshly slaughtered hogs in this study while that in Ibarra (1983), it was taken from a chilled carcass. It has been reported that carcass weight tend to decrease by 2% after it had been chilled (Ibarra 1983).

Wholesale Cuts

Table 2 shows the weight of four major cuts of the hog with the different treatments. These were composed of shoulder, ham, belly, and loin expressed as percent of slaughter weight of hogs with an average slaughter weight of 65.89 kg. Statistical analysis showed no significant difference in all of the treatments. The average weights of shoulder, ham, loin, and belly with an average slaughter weight of 65.89 kg expressed as percent of slaughter weight were 17.40 %, 20.69 %, 10.31 % and 15.46 %, respectively.

Table 2. Wholesale cuts of swine expressed as percent of slaughter weight

TREATMENT	SHOULDER	HAM	LOIN	BELLY
Commercial feeds	17.54	20.18	9.85	15.52
CF + azolla	16.73	21.05	10.42	15.34
CF + sweet potato leaves	17.94	20.85	10.66	15.52

Means are not significantly different ($P \geq 0.05$) DMRT



In this study, the percent wholesale cuts obtained are relatively higher than that of Ibarra (1983). The percent wholesale cuts of 87.90 kg reported by Ibarra were 15.19 % shoulder, 16.74 % loin, 19.20% ham and 16.37 % belly having a slaughter weight of 87.90 kg. As in the carcass weight, the weights of the different cuts were obtained from freshly slaughtered hogs while that in Ibarra, it was obtained in chilled carcass. In fabricating freshly slaughtered carcasses, the greatest challenge was to obtain uniform cuts as unchilled carcass tends to be slippery.

Table 3 presents the percent wholesale cuts of hogs with an average carcass weight of 44.02 kg. Statistical analysis showed no significant difference between treatments. The weight of shoulder, ham, belly, and loin expressed as percent of carcass weight of hogs slaughtered at an average of 65.89 kg live weight were 26.40%, 31.52 %, 15.72% and 23.40%, respectively.

Table 3. Wholesale cuts of swine expressed as percent of carcass weight

TREATMENT	SHOULDER	HAM	LOIN	BELLY
Commercial feeds	26.74	30.81	15.11	23.66
CF + azolla	25.79	32.55	15.99	23.81
CF + sweet Potato leaves	26.67	31.2	16.06	22.74

Means are not significantly different ($P \geq 0.05$) DMRT



Abdominal Fat , Edible Entrails
and Average Backfat Thickness of Hogs

Statistical analysis showed no significant differences in all of the treatments in weight of edible entrails, expressed as percent slaughter weight of 65.89 kg. Results revealed that hogs given commercial feed + sweet potato leaves had percent edible entrails of 7.9 %, hogs given commercial feeds + azolla had percent edible entrails of 5.73% and those given pure commercial feeds had a percent edible entrails of 4.98 %. The edible entrails include the lungs, liver, heart, empty stomach, empty small and large intestines expressed as slaughter weight.

In terms of abdominal fat, statistical analysis showed no significant difference between treatments. Percent abdominal fat of hogs given pure commercial feeds, those given commercial feeds + sweet potato, and those given commercial feeds + azolla were 0.50%, 0.43% and 0.18 %, respectively. This indicates that the abdominal fat of the hog were almost the same.

The back fat thickness of hogs slaughtered at an average weight of 65.89 kg is shown in Table 4. Statistical analysis showed no significant differences between treatments. The average backfat thickness of hogs given pure commercial feed, hogs given commercial feeds + sweet potato and those given commercial feeds + azolla were 1.93 cm, 1.88 cm and 1.79 .cm, respectively

Backfat thickness was obtained from the average of backfat measurement taken from the carcass at the region of the first rib (P₁), last rib (P₂), and at the region of lumbar vertebra (P₃). According to PCARRD (2005), the standard backfat thickness for hogs is 2.00 cm. The backfat thickness obtained in this study is lower, perhaps because these



measurements were obtained in growing pigs while that in PCARRD was obtained in finished hogs.

Table 4. Abdominal fat, edible entrails and back fat thickness of hogs

TREATMENT	ABDOMINAL FAT	EDIBLE ENTRAILS	AVERAGE BACK FAT THICKNESS
Commercial feeds	0.50	4.98	1.93
CF + azolla	0.18	5.73	1.79
CF + sweet Potato leaves	0.42	7.90	1.88

Means are not significantly different ($P \geq 0.05$) DMRT

Table 5. Measurement of carcass length and loin eye area

TREATMENT	CARCASS LENGTH (cm)	LOIN EYE AREA (cm)
Commercial feeds	82.97	23.87
CF + azolla	84.67	25.18
CF + sweet potato leaves	77.89	24.42

Means are not significantly different ($P \geq 0.05$) DMRT

Table 5 presents the carcass length and loin eye area. Statistical analysis revealed no significant difference between treatments. It is shown in the table that the hog given commercial feeds +azolla had a carcass length of 84.67 cm and a loin eye area measurement of 25.18 cm. The hog given pure commercial feeds follows with a carcass length of 82.97 cm and had a loin eye area measurement 23.87 cm. The hog given commercial feeds +sweet potato leaves had a carcass length of 77.89 cm and loin eye area measuring 24.42 cm.



Characteristics of the Steamed Pork Based on Hedonic Scale

Table 6 shows the appearance and acceptability rating of steamed pork. The computed values showed that there is no significant difference on the appearance and the acceptability of the products. Based on 20 respondents, the appearance of steamed pork was rated as slightly desirable (3.38). As to acceptability, steamed pork was given a numeral rating of 3.41, with a description of likes moderately. Appearance refers to the way meat looks either carcass or boneless meat cuts and acceptability indicates the type and stage to which the meat has been subjected, as well as the stage of freshness.

Table 7 shows the rating of the aroma and taste of the steamed pork. Statistical analysis showed no significant difference between treatments. The aroma of steamed pork was rated 3.43 which is likes moderately. However, taste of steamed pork was moderately good which was rated as 3.48, respectively. These characteristics are related to each other to certain extent because they have evaluated together for the reliable determination of a product's flavor. Pork is chemically less stable than the other animals so aroma is often observed

Table 8 presents the tenderness and juiciness of the steamed pork. Statistical Analysis showed no significant differences on the tenderness and juiciness of the product. The tenderness of the steamed pork was rated as moderately tender (3.178) based on the 20 respondents. In terms of Juiciness of steamed pork, it had a numerical rating of 3.156 with a description of moderately juicy. As an animal matures and the size of each muscle fiber increases, there would be an expected decrease in tenderness



Table 6. Appearance and acceptability rating of the product based on hedonic scale

TREATMENT	APPEARANCE		ACCEPTABILITY	
	RATING	DESCRIPTION	RATING	DESCRIPTION
Commercial feeds	3.550	Slightly Desirable	3.500	Likes moderately
CF + azolla	3.433	Slightly Desirable	3.333	Likes moderately
CF + sweet potato leaves	3.150	Slightly Desirable	3.383	Likes moderately

n=20

Table 7. Aroma and taste rating of the product based on hedonic scale

TREATMENT	AROMA		TASTE	
	RATING	DESCRIPTION	RATING	DESCRIPTION
Commercial feeds	3.48	Likes moderately	3.51	Moderately good
CF + azolla	3.35	Likes moderately	3.45	Moderately good
CF + sweet Potato leaves	3.45	Likes moderately	3.48	Moderately good

n =20

Table 8. Tenderness and juiciness rating of the product based on hedonic scale

TREATMENT	TENDERNESS		JUICINESS	
	RATING	DESCRIPTION	RATING	DESCRIPTION
Commercial feeds	3.133	Moderately tender	3.153	Moderately Juicy
CF + azolla	3.083	Moderately tender	3.083	Moderately Juicy
CF + sweet leaves	3.317	Moderately tender	3.200	Moderately Juicy

n= 20



SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

This study was conducted to determine the effect of pure commercial feeds , commercial feeds + azolla and commercial feeds + sweet potato leaves on the dressing percentage, wholesale cuts, abdominal fat, edible entrails, back fat thickness, carcass length and loin eye area. Nine hogs were distributed to three treatments: pure commercial feeds, commercial feeds + azolla, and commercial feeds + sweet potato leaves. Each treatment was replicated three times.

Data were analyzed using the analysis of variance appropriated for the CRD. To compare the means, Duncan's Multiple Range Test was used.

Based on the result of the study, it showed that supplementing swine rations with pure commercial feeds, commercial feeds + azolla , and commercial feeds + sweet potato leaves has no significant effect on the dressing percentage, weight of wholesale cuts (shoulder, ham, loin, and belly) expressed as percent carcass weight, weight of edible entrails expressed as percent of slaughter weight, carcass length, and backfat thickness of 65.89 kg hogs. The average dressing percentage of approximately 65.89 kg of hogs was 66.76 %. The wholesale cuts expressed as percent of slaughter weight were: 17. 40% shoulder, 20.70% ham, 10.31 % loin, and 15.40% belly. While the average weight of edible entrails expressed as percent of slaughter weight was 6.20 %. The average of carcass length and back fat thickness, were 81.84 cm and 1.88 cm, respectively. Likewise, there was no significant difference in the abdominal fat expressed as percent of carcass weight. Hogs given pure commercial feeds had an average percent abdominal fat of 0.50%, those given



commercial feeds + Sweet potato Leaves, 0.42 % and those give Commercial feeds + Sweet potato leaves, 0.18 %.

Organoleptic evaluation that consists describing the attributes of meat in terms of appearance, acceptability, aroma, taste, tenderness and juiciness showed that the dietary treatments imposed on hogs prior to slaughter did not cause any significant effect. Meat derived from 65.89 kg hogs given the different dietary treatments were rated as moderately desirable (3.38 %) in appearance, moderately desirable (3.37%) in acceptability, likes moderately (3.406 %) in aroma, moderately good (3.428 %) in taste, moderately tender (3.156 %) in tenderness and moderately juicy (3.178 %) in juiciness respectively.

Conclusion

It was concluded that commercial feeds + azolla and commercial feeds + sweet potato leaves have the same effect on the different carcass characteristics considered on this study.

Recommendation

Commercial feeds + azolla and commercial feeds + sweet potato leaves may be used as feed supplement in swine based on the results showed in the study as all the qualities do not interact on the different treatments.



LITERATURE CITED

- ACKER, D . 1983. Animal Science And Industry . Third Edition. Prentice-Hall, Inc . , Englewood Cliffs, New York Jersey 07632. Pp. 139-415.
- ENTREPINOY. 2009. Guide To Proper Feeding of Hog/swine. <http://www.mixph.com> . / 2009/ guide to Proper Feeding of Hog / Swine. Html. Bussiness Coach Inc. Retrived on May 4, 2012 at yahoo. Com.
- FOOD AND AGRICULTURE ORGANIZATION. 2009. Rabbit meat. Retrieved July 8, 2012 from the Worldwide Web: <http://www.Fao.Org/wairdocs/ilri/x5458e09HTML>.
- FOOD AND AGRICULTURE ORGANIZATION. 2012. Retrieved September 15, 2012 from the Worldwide Web: <http://www.Fao.Org>.
- FOWLER, V.R. and LAWRENCE , T. L . J . 2002 . Growth of Farm Animals . 2nd Ed. Cromwell Press, Trowbrige, Uk. P.8.
- FUZHOU F. and PURSEGLOVE, R . 1989 Azolla Utilization , Proceeding to the Workshop on Azolla Use. China International Rice Institute, Manila Philippines. P 22.
- IBARRA , P. I. 1983 . Meat Processing for Small and Medium Scale Operations . Published by the University of the Philippines at Los Banos College of Agriculture , College Laguna Philippines.
- NATIONAL AZOLLA ACTION PROGRAM . 1989 . University of the Philippines , University of the Philippines, Los Banos Laguna Philippines. P. 65.
- SANICO R.T and PALOMAR M.K. 1989, Sweet potato Research and Development for Small farmers. seameo-searca. College of Laguna, Philippines. P 17.
- WHITTEMORE, C.T. 1998. The Science and practice Of Pig Production. Second Edition. Blackwell Science , Inc. Commerce Place 350 Main Street Malden, Ma. 091485018. P 4.

