BIBLIOGRAPHY

PACSI, MARILOU Y. APRIL 2012. Physico-Chemical Properties of Hot-Smoked Pork as Affected by Dry Curing with White Sugar. Benguet State University, La Trinidad, Benguet.

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ABSTRACT

The study was conducted to determine the effects of the white sugar on the physical and chemical properties of commercial pork using alnus as smoking material. Specifically, it aimed to: determine the physical properties of hot-smoked pork in terms of shrinkage percentage and color as affected by white sugar as a curing ingredient; determine the chemical properties of hot-smoked pork in terms of ash content, crude fat, crude protein, and moisture content as affected by white sugar; and determine the nutrition facts per serving of the smoked pork.

Following complete randomized design (CRD), a total of 16 kg of pork were obtained from the commercial pig and divided into four treatments with four replications each. The different treatments used in the study were 180 grams of rock salt, 100 grams of white sugar, and 150 grams of white sugar and 200 grams of white sugar.

Results of the study revealed that the hot smoked pork with 100 grams of white sugar had the lowest shrinkage of 83.44% and pork with 180 grams of rock salt 84.03%

when compared to the pork with 150 grams of white sugar and 200 grams of white sugar, with 85.07% shrinkage and 85.69%, respectively.

The results of the chemical composition of the treatments, i.e. nutrient composition and nutrition facts, were dependent on the proportion of the fat and lean of the samples subjected for analysis, thus, further studies are recommended on the effect of white sugar on the nutrient composition of smoked pork.

INTRODUCTION

Meat is the most valuable livestock product for many people serving as their first choice source of animal protein. The word 'pork' denotes specially the fresh meat of the pig. It is one of the most-commonly consumed meats worldwide, with evidence of pig husbandry dating back to 5000 BC (Heinz and Hautzinger, 2007*)*.Today, pork is processed into different products not only to improve its market value but also for variety reasons to satisfy the taste of the people. Thus being of the perishable food, meat deteriorates very fast under normal condition .It is prone to spoilage which can be categorized as biological, physical and chemical forces. While several types of deterioration changes are all significant and must be controlled for maintenance of meat quality.

Meat preservation is lengthening the storage life of meat. The basic principle of meat preservation is preventing or delaying spoilage through smoking or curing of meat (Ibarra, 1983). Smoking or curing is usually carried out simultaneously with heat processing. Smoke deposition gives a characteristic flavor to product, preservation; phenolic components provide some degree of protection against fat oxidation and creation of new products (Prince and Schweigert, 1971).

Even before the birth of Christ (BC), smoking and salting is the ancient practices made to preserve meat, thus, now a day's people are trying to use sugar as curing material for preservation. Sugar is a simple carbohydrate that we use for energy. It can preserve meat and fruits in the form of jams, jellies, because the high sugar content will not let bacteria, yeasts or molds grow due to diffusion. It also contributes to the growth of beneficial bacteria like *lactobacillus* by feeding them, so any method that can contradict

the forces of meat deterioration is good preservation method but its application to meat must be done as soon as possible (Ibarra, 1983).

The purpose of curing meat is to convert live hogs or other meat animals that are good conditions into high quality cured meat products to keep for future use.

Because fresh pork easily deteriorates, there is a need for a preservation method that would not only result in longer shelf life but also enhance quality of the finished product. Just like salt, sugar preserves by its capability to bind water and deprive the meat of moisture. With less water available, it makes difficult for microorganisms to grow. Hot smoking, on the other hand, adds flavor and tenderizes the meat. This study is being proposed to take advantage of the preservative power of sugar and of the beneficial effects of hot smoking using alnus wood.

The study will benefit those researchers and students as it may provide additional information for further researches. Also, it can serve as basis for meat processors to further improve their products.

Generally, the study was conducted to determine the effect of white sugar on some physical and chemical properties of hot-smoked pork.

Specifically, it aimed to:

1. determine the physical properties of hot-smoked pork in terms of shrinkage percentage and color as affected by white sugar as a curing ingredient;

2. determine the chemical properties of hot-smoked pork in terms of ash content, crude fat, crude protein, and moisture content as affected by white sugar; and

3. determine the nutrition facts per serving of the smoked pork.

The study was conducted at the Animal Genetic Resources (TANGERE) Project Laboratory of Benguet State University in Bektey, Puguis, La Trinidad,Benguet on January 2012.

REVIEW OF LITERATURE

Meat has been used as food even before historians started to record events and it is highly perishable product which deteriorative changes begin soon after bleeding the animal. The primary cause of product deterioration is microorganisms which may be bacteria, yeast, or molds. The several types of deterioration changes are all significant and must be controlled for maintenance of meat quality (Prince, and Schweigert, 1971).

Meat preservation should always be accompanied with good handling practices. Preservation effort is not bringing spoiled meat to freshness but rather an effort to maintain its freshness or minimize the loss of freshness (PCARRD, 1991).

Gamma and Sherington (1994) cited that the main aims of preservation are to prevent autolysis and microbial growth. Preservation may short-term or long-term and maybe achieved in variety of ways. Blanching food in order to inactivate enzymes and prevent autolysis maybe regarded as a short-term means of preservation. Long-term methods of preservation usually involve the removal of more than one of the requirements necessary for microbial growth.

Ibarra (1983) also cited that smoking as applied to cured products is the process of subjecting meat to the action of smoke and heat generated by burning hardwood or saw dust. Smoking is a processing step used by the food industry centuries ago. Smoking originated from the practice of suspending meat, fish, and fowl near the smoked vent of a tent or on top of a stove of a hut. Years later, the yearning for smoked flavor developed. Today, smoking is commonly employed as the last process in the manufacture of ham, bacon, sausage and other cured products.

He also cited that one important property of smoke is its anti-microbiological effect. During smoking, a coat of creosote at the surface of the meat is formed. This film at the outer portion of the meat acts as a barrier against the evaporation of moisture and entry of insects and microorganisms to the products. Some of the components of smoke such as the phenols and organic acids are bactericidal and/ or bacteriostatic agents and used to extend the shelf life of food, particularly meat, long before the invention of chemical preservatives and the refrigerator. Smoking adds flavor and tenderizes the meat. Smoking is the process of flavoring, cooking, or preserving food by exposing it to the smoke from burning or smoldering plant materials, most often wood. Smoking is a natural way of preserving meat. It is also an ancient method of food preservation that is still practiced because it adds an interesting flavor to the meat, fish, poultry and other foods. Smoking is a preservative because smoke contains chemical compositions that retard the growth of harmful bacteria.

There are two principal smoking techniques: cold and hot smoking. Hot smoking is carried out at temperature of 60 to 80^0C (140ºF- 176ºF). The thermal destruction of the wood used for the smoking is normally not sufficient to produce these temperatures in the smoking chamber. Hence, the additional heat has to be applied in the smoking chamber.

Sugar (carbohydrates) serves several important purposes in cured meat. First of all, the added sugar functions for flavor, lowering activity, yield; it counteracts the harshness of salt and as a source of energy for function and spoilage microorganisms. Also sugar provides a surface color characteristic of aged ham if caramelized sugar is used. Both brown and white can be used. The sugar most frequently used sucrose, cane sugar, dextrose, and invert sugar. The amount of sugar used is self-limiting due to its

sweetening power. Sugar has only a very low capacity to destroy microorganisms, thus almost no bacteriological effect. Its preserving power is attributed by its capability to bind water and not to deprive the meat of moisture. The water loosely bound protein molecules as well as "free" water will attract by the sugar causing a reduction of the water activity of the product. This means that less water will be available and the environment will be less favorable for the growth of microorganism (Nummer, 2002).

He also cited that sugar commonly used in curing is cane or beet sugar also known as "sucrose". Sometimes other sugars, syrup, and molasses are used and they all have a different chemical composition. Very popular is light-colored and well refined sugar called "dextrose", also known as cerelose. Keep in mind that dextrose (corn sugar) contains less sugar cane or beet sugar and obviously tastes less sweet. A sugar found in raisin syrup and in honey is known as "fructose", sometimes called levulose. There is a sugar called "lactose" in powdered milk products. Under certain conditions sucrose (common sugar) can be split into two sugars of equal proportions.

Gamman and Sherrington (1994) cited that the energy value of food depends on the quantity of carbohydrates, fat and protein in the food. Since 1gram of fat provides 38 kilo joule or KJ (1kcal=4.18 KJ), approximately twice the number of KJ from 1g of carbohydrate or protein, it follows that fatty foods supply the most energy. Foods containing a high percentage of water and therefore a smaller proportion of energy giving nutrients provide the least energy.

They also cited that fat has more than twice the calorie value of carbohydrates and is therefore a more concentrated source of energy. Furthermore, they cited the composition of meat is very variable. The fat content varies from 10% to 50% depending on the animal and the part of the animal from which the meat has come.

MATERIALS AND METHODS

The materials used in the study were 16 kilograms of fresh pork obtained from the carcass of a commercial pig. The other materials used include the following: white sugar, stainless container, knives, chopping boards, weighing scale, record book, pen, and alnus firewood and leaves (Figure 1).

Preparation of meat. A total of 16 kg of pork was taken from the warm carcass of a white pig. Pork pieces were cut into 1-inch thick strips containing the skin, fat and lean. The strips were then washed and drained. After draining, the pork strips were placed in a stainless pan for curing (Figure 2).

Experimental design and treatments. Following the Completely Randomized Design (CRD), the slices of pork were equally divided into the four treatments. Each treatment has four replications with one kilogram of pork per replication.

The different treatments were as follows:

T_0 = 180 grams of rock salt (control)

T_1= 100 grams of white sugar

T_2= 150 grams of white sugar

T_3= 200 grams of white sugar

The pork used in all the treatments was subjected to the same procedure. The only difference was on the amount of the sugar per treatment. The pork slices assigned in all the treatment were smoked for 16 hours at 8 hours of smoking per day.

Figure 1. Some materials used in the study

Figure 2. Pork strips placed in stainless pans for curing

Curing. The pork under each treatment was cured with rock salt and white sugar following the amount indicated. White sugar was rubbed thoroughly on both sides of the pork

strips. After rubbing the sugar, the pork were placed in a clean stainless container and allowed to cure for seven days. At the end of curing period, the pork strips was taken out of the containers and any undissolved sugar and salt were scraped or brushed off. This is necessary to prevent the appearance of the very objectionable white crust on the surface of the pork.

Hot smoking. Each pork strip was weighed and labeled for identification. The pork strips were stringed by making a small cut with a narrow bladed knife, then inserting a cord into the cut; these were hanged in the smoking chamber. The hangers were arranged in such a way that prevented the pork strips from coming in contact with other, to ensure uniform penetration of smoke, and to guarantee the pork strips to have equal color development. The pork strips were suspended above the safety baffle in the smoker (Figure 3).

Figure 3.Meat strips (left) hanged inside the smoking chamber (right)

To produce the smoke, pieces of air-dried alnus wood (about 1kg) were lighted inside the fire pit.

When the wood had been lighted and fire emitted was stable, fresh alnus firewood was placed over the fire to produce smoke. Initially, ¼ kg of fresh alnus firewood was spread over the burning wood to produce the smoke and then ¼ kg of fresh alnus firewood was added every 20 minutes until the end of smoking duration. All treatments have undergone 16 hours of hot smoking at 8 hours of smoking per day.

Physical and chemical properties of the smoked pork. After smoking, each of the pork pieces were weighed individually and recorded for the determination of the shrinkage percentage. Color of the smoked pork products are also be evaluated.

From each treatment, samples of about 250g were obtained, properly packed and labeled for analysis. Chemical analysis of samples was done at the Regional Standards and Testing Laboratory of the Department of Science and Technology, Cordillera Administrative Region (DOST-CAR).

Sanitation and hygiene. To prevent or minimize microbial contamination, the following good hygienic practices (DOH, 2004) in meat processing and handling of smoked products were observe:

1. Maintaining adequate personal cleanliness.
2. Wearing adequate garments, and hand gloves.
3. Washing hands before starting work and repeatedly during work.
4. No rings, watches and bracelets shall be worn during work.
5. Cleaning/Disinfection of tools, knives, chopping boards, utensils, and other materials for meat handling.

6. Taking any other necessary precautions to protect against contamination of me meat and finished product.

Data Gathered

1. Physical Properties

1.1 Shrinkage %. This was obtained by dividing the weight of the meat after smoking by its weight before smoking then multiplied by 100%. This was taken per replicate.

1.2. Color. This was determined visually at the end of the smoking period.

2. Chemical Properties

1.1 Nutrient analysis. The amount of minerals (ash), crude fat, crude protein, moisture, and energy were analyzed using AOAC (2005) methods while energy and carbohydrate contents were calculated using FNRI-DOST handbook (1997).

2.1.1. Ash by gravimetric method (AOAC Method No. 942.05)

2.1.2. Crude fat by Soxhlet extraction (AOAC Method No. 920.39)

2.1.3. Crude protein by Kjeldahl method (AOAC Method No.981.10 and in Accordance with 2000 Digestion System and Kjeltec 2000 Distilling Unit Instruction Manual.)

2.1.4. Moisture by oven method (AOAC Method No.934.01).

2.1.5. Carbohydrate by calculation (FNRI-DOST Handbook).

2.1.6. Energy by calculation (FNRI-DOST Handbook).

2.2. Nutrition facts. The amount of calories, calories from fat, total fat, and protein were calculated at the DOST- CAR Regional Standard and Testing Laboratory.

Data Computed

1. Shrinkage percentage. The amount of moisture loss was calculated by using the formula:

$$\% \text{ Moisture Loss} = \frac{\text{Weight before Smoking- Weight after Smoking}}{\text{Weight before Smoking}} \times 100$$

2. Nutrition facts. Amount of calories, total fat, carbohydrates and protein that were analyzed at the DOST- CAR Regional Standards and Testing laboratory.

3. Total cost of production (TCP). This was computed by adding the cost of the meat and the ingredients used.

4. Net income. This was obtained by deducting all the cost of production from the total sales.

5. Return on investment. This was obtained by dividing the Net Income by the Total Cost of Production multiplied by 100.

Statistical Analysis

The data on shrinkage were recorded tabulated and analyzed for difference using the analysis of variance. The Duncan's Multiple Range Test (DMRT) was used to determine significant differences between treatment means.

RESULTS AND DISCUSSION

Amount of Shrinkage

The shrinkage percentage represents the loss of moisture from the sample due to the amount of white sugar used. Table 1 show that the amount of shrinkage of the smoked pork significantly differed as affected by the amount of sugar.

Pork with 100 grams of white sugar (T_1) had the lowest shrinkage of 83.44% and pork with 180 grams salt control (T_0) 84.03% when compared to the pork with 150 grams of white sugar (T_2) and 200 grams of white sugar, with 85.07% shrinkage and 85.69%, respectively. The amount of sugar greatly affected the shrinkage of the samples. The sample hot smoked with 200 grams of white sugar was observed to have the highest shrinkage loss. According to Brown (2005), Diffusion says that water will travel from high levels of concentration to low. The water in the unicellular organisms is drawn out of them.

High concentrations of sugar can act as preservative by inhibiting the growth of microorganisms. Osmotic pressure created by the high concentration of sugar dehydrates the bacteria or yeast cells to the point of inactivation or death.

The effect of curing and smoking is relatively simple to define. Both methods have bacteriostatic effect by reducing the available water, and creating an environment hostile to bacteria. The drying effect of smoke and the smoke components, creosote, acetic acid, pyroligneous acids inhibit bacteria, and retard fat oxidation. This finding agrees with Corinto (2005), who cited that the reduction of water is one of the aims of smoking. This is one of the stages of preservation.

Table 1. Mean shrinkage of pork as affected by amount of white sugar (%)

TREATMENT	MEAN
180 grams of rock salt	84.03[c]
100 grams of white sugar	83.44[d]
150 grams of white sugar	85.07[b]
200 grams of white sugar	85.69[a]

Color of the Meat

The color of the meat in day 1 is brownish, but at day 2 the surface color become black, while the color inside is pink (Figure 4). This is affected by the curing materials and the action of smoking. Ibarra (1983) cited that the first noticeable physical change in meat during smoking is the coagulation of the surface and the color changes. In fresh meat, the red color changes to grey or grayish brown while in processed meat the red color changes to the stable pink color.

According to Brown (2005), cited that caramelization results from heating sugar. Sucrose heated will start to melt into a clear, viscous mass when heated to about 320 °F (160°C). If heating continuous to 338° F (170°C) the melted sugar mass will become smooth and glossy and start to caramelize.

Caramelized sugar are less sweet but more flavorful than the original sugar. The darker the caramel, the less sweet it is.

Figure 4. Meat strips smoked day 1 (left) meat strip smoked day 2 (right)

Nutrient Composition

The chemical analysis determines the content of the samples to establish its nutritive and economic value. Table 2 presents the results of food composition analysis of smoked pork in the different treatments in terms of ash, crude fat, crude protein, moisture contents and energy contents in kilocalories.

Results in the Table show that the pork with 100 grams of white sugar has the highest moisture content of 33.75 % followed by the pork with 180 grams of rock salts which has 28.20 %, and pork with 150 grams of white sugar which has 18.64% and lastly pork with 200 grams of white sugar which has 15.39%. The above result is brought about by the effect of the amount of white sugar.

Results show that the hot smoked pork with 180 grams of rock salt, 100 grams of white sugar, and 150 grams of white sugar and 200 grams of white sugar had crude protein contents of 29.66%, 28.44%, 22.60%, and 21.97%, respectively.

Table 2 also shows that hot smoked pork with 200 grams of white sugar has a crude fat content of 51.64% and at the same time an energy value of 593 kcal. Whereas, the hot smoked pork with 150 grams of white sugar had a crude fat content of 44.87% and an energy value of 546 kcal. Hot smoked pork with 100 grams of white sugar had a crude fat content of 25.26% and an energy value of 387 kcal. And, hot smoked pork with 180 grams of salt had a crude fat content of 29.77% and an energy value of 387 kcal.

Table 2. Nutrient composition of hot smoked pork as affected by amount of white sugar

FOOD COMPOSITION	AMOUNT OF WHITE SUGAR			
	180 grams of rock salt	100 grams of white sugar	150 grams of white sugar	200 grams of white sugar
Moisture, %, w/w	28.20	33.72	18.64	15.39
Energy, kcal	387.00	387.00	546.00	593.00
Crude fat, %,w/w	29.77	25.26	44.87	15.64
Crude Protein, %,w/w	29.66	28.44	22.60	21.97
Ash, %,w/w	13.55	1.20	0.93	0.97
Carbohydrates, %,w/w	0	11.38	12.95	10.03
Sodium, mg/100g	4307*	-	-	-
Total Sugar, %, w/w	_	11.38	12.95	10.03

Analyzed by the regional Standards and Testing Laboratory of the Department of Science and Technology-CAR, La Trinidad, Benguet.
*Test result which is outside the laboratory's scope of accreditation

According to Gamman and Sherrington (1994) the energy value and crude fat contents are closely related since the higher the crude fat content, the higher the energy value content of the product. Fat has more than twice the calorie value of carbohydrates and is therefore a more concentrated source of energy.

Results also show that the hot smoked pork with 180 grams of rock salts, 100 grams of white sugar, 150 grams of white sugar and 200 grams of white sugar had ash contents of 13.55%, 1.20%, 0.93% and 0.97%, respectively.

Results show that carbohydrates and total sugar are related to each other. The result show that 150 grams of white sugar had the highest carbohydrates and total sugar which is 12.95% as compared to 100 grams of white sugar and 200 grams of white sugar which has 11.38% and 10.03% respectively. The sugar content depends on the amount of sugar that had been dissolved into the meat during the curing period.

According to Kierant, Johnson and Siedler (1964), the control of moisture, fat and protein is difficult due to the fact that is not possible to obtain a high degree of uniformity in the lean and fatty meat ingredients in various sausage formulations. For instance, considerable variations from one lot of beef or pork trim to another are possible.

There is considerable variation between the animals themselves; the trimming operation also introduces variations. The sausage producer should control these variations in the sausage mix in order to obtain a more uniform finished product which, obviously, will have more appeal from the customer's viewpoint.

These nutrient compositions were dependent on the portion of pork submitted for analysis and not on the amount of white sugar. Furthermore, there was only one sample per treatment was analyzed.

Nutrition Facts

The nutrition facts normally appear in food labels as prescribed by the Bureau of Food and Drugs (BFD) of the Department of Health. Table 3 presents the computed nutrition facts of hot smoked pork in the different treatments in terms of energy, total fat and protein contents.

Results show that the hot smoked pork with 200 grams of white sugar had a total fat content of 54.76g and protein contents of 10.33g resulting in having an energy value of 29.65 kcal, whereas the smoked pork with 100 grams of white sugar and 150 grams of white sugar had energy values of 19.35 kcal and 27.30 kcal, respectively. The smoked pork with 150 grams of white sugar had a carbohydrate of 6.09 %, 5.35 % in 100 grams of white sugar and 4.71 % in 200 grams of white sugar.

The differences in the energy content of the hot smoked pork in this study was due to the differences in the proportion of fat and lean of the sample subjected for analysis. Ciano (2010) cited in his study that during the process of drying, whether by smoking or sun drying, the pork is exposed to heat. The constant heat at a prolonged period of time, fats is dissolved from the meat.

Surprisingly, the energy content of the hot smoked pork with 200 grams of white sugar was higher than that of hot smoked pork with 150 grams of white sugar. This possibly because the meat sample obtained for the hot smoked pork with 150 grams of white sugar had a little bit more lean (flesh) with a little bit lesser fat composition compared to that of the meat sample obtained from the hot smoked pork with 200 grams of white sugar.

The energy value of the food which include meat and according to Gamman and Sherrington (1994), the energy value of food depends on the quantities of

The protein content of the hot smoked pork varies from 13.37-10.62g depending on what part of the meat that had composed the sample subjected to analysis. However, it must be considered that meat and meat products provide a complete protein source that contains, in favorable quantities, all the amino acids.

Table 3. Nutritional facts of hot smoked pork samples from the different treatments as analyzed at the DOST-CAR La Trinidad, Benguet.

Amount Per Serving (Serving Size is 235g)	AMOUNT OF WHITE SUGAR		
	100grams	150 grams	200 grams
Energy	19.35	27.30	29.65
Fats	26.74	47.45	54.76
Protein	13.37	10.62	10.33
Carbohydrate	5.35	6.09	4.71

*Percent daily values are based on a 2,000 calories diet

Table 4 shows the sales, expenses, net income and return of investment of the treatments.

The smoked pork with 100 grams of white sugar had the highest mean in ROI (16.29 %). This is followed by the 180 grams of rock salt (12.79 %), smoked pork with 150 grams of white sugar (3.66) and smoked pork with 200 grams of white sugar resulting in (-1.78%), because the treatment has low total sales and high in total cost of production. The table also reveals that smoked pork with 100 grams of white sugar had the second lowest cost of production and highest in terms of sales, thus realizing a higher income. This is because of the higher weight produced.

Table 4. Return on investment

TREATMENT	SALES (Php)	EXPENSES (Php)	NET INCOME (Php)	ROI (%)
180 grams of rock salt	896.00	794.40	101.60	12.79
100 grams of white sugar	927.50	798.00	129.50	16.29
150 grams of white sugar	836.50	807.00	29.50	3.66
200 grams of white sugar	801.50	816.00	-14.50	-1.78

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study was conducted to determine the effects of white sugar on the physical and chemical properties of hot smoked pork using alnus tree as the smoking material. The study was conducted at the TANGERE Project Laboratory of Benguet State University in Bektey, Puguis, La Trinidad on January 2012.

Following the completely randomized design (CRD), the 16 kilograms of pork, from a carcass of a commercial pig was equally divided into four to make up four treatments. Each treatment has four replications, with 1 kilogram of pork per replication.

To produce the hot smoked product, same procedure was followed in all the four treatment except on the amount of white sugar per treatment. The meat assigned in treatment 0 were 180 grams of rock salt, 100 grams of white sugar for treatment 1, 150 grams of white sugar for treatment 2 and 200 grams of white sugar for treatment 3.

The data gathered were focused on the physical properties of the hot smoked pork in terms of shrinking percentage and color of the pork after smoking and chemical properties in terms of food composition; moisture, crude protein, crude fat, carbohydrate, ash and energy contents, and nutrition facts.

In terms of shrinkage percentage, the hot smoked pork with 100 grams had the lowest shrinkage and hot smoked pork with 200 grams had the highest shrinkage. These results prove that pork with higher amount of white sugar, have higher water loss.

The results of the chemical composition of the treatment, examples; nutrient composition and the nutrition facts, were dependent on the portion of the pork subjected for analysis.

Conclusions

Based on the results of the study, the following conclusions were drawn:

1. Pork with 100 grams of white sugar had the lowest shrinkage making it more susceptible to bacterial growth.

2. Pork with 150 grams of white sugar had higher amount of sugar was high in crude fat and carbohydrate.

3. The pork with 200 grams of white sugar had the lowest moisture content; therefore, it can be stored in a longer period of time.

Recommendations

Based on the above results, the following recommendations are offered for consideration:

1. Pork with higher amount of white sugar can be stored for a longer period of time.
2. Pork can be cured with small amount of sugar if the purpose is to have a smoked flavored meat that will be consumed immediately.
3. Further, studies are recommended on the effect of white sugar on the nutrient composition of smoked pork.

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