



## MAPPING OF BARBECUE SPOTS WITHIN BAUCHI METROPLIS USING GEOGRAPHICAL INFORMATION SYSTEM (GIS)

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### ***Abstract***

Since the emergence of Geographical Information System (GIS), it has continually proved its capability and relevance in our day-to-day activities. This study

### ***Keywords:***

Gis, Gps, Barbecue

was carried out to locate barbecue spots in Bauchi town, to create a database and a digital map of the study area that will be of a great benefit to tourists that might wish to have a

taste of local meat. The location of the spots was carried out using the Global Positioning System (GPS). The attribute data were collected by means of questionnaires. Primary data were manipulated using AutoCAD 2001 and Arc View 3.2a software. A digital map showing the location of the different spots was finally produced and printed out for presentation. It was concluded that

### **INTRODUCTION**

The word barbecue comes from the language of a Caribbean Indian tribe called the Taino. Their word for grilling on a raised wooden grate is barbecue. The word first appeared in print in a Spanish explorer's account of the West Indies in 1526, according to Planet Barbecue. Since then, the popularity of barbecues has spread like wildfire. The history of barbecuing in America dates to colonial times, and it has been a part of American culture ever since. In fact, one of the first laws enacted in the colony of Virginia during the 1650s forbidden the discharge of guns at a barbecue. Today, barbecuing plays an especially large role in global cuisine, which is notorious for its rich and zesty flavour. For example, the people of Northern Nigeria have

considering the nutritious importance of barbecue and its contributions to revenue generation, tourism and in reducing unemployment that boost national development, it is not out of place to pay attention to barbecue spots and to encourage the development of barbecue business especially in Bauchi state. To achieve this, the study recommended among other things that the government of Bauchi state should provide loan facilities to those who are into the business of barbecue so as to encourage them, and that a compendium of barbecue locations should be made available in hotels and other recreational areas.

been barbecuing mutton not delicate lamb, but big, gamey mutton for years. It is still a specialty in many cities and towns in Nigeria. (Melina, 2010). Meat and other animal products make valuable contributions to diets of developing countries due to its high nutritional qualities (Olusola, Okubanjo, & Omojola, 2012). Meat is an excellent source of high quality protein and it also contains large amounts of minerals and essential vitamins as well as fats and carbohydrate for energy. Meat is usually an expensive item in Nigerian diet and a very small quantity of meat can greatly improve a meal as their protein will supplement the vegetable proteins and a balanced meal will thus be provided (Ikeme in Iheagwara & Okonkwo, 2016).

Meat is basically defined as the flesh of animals, which are suitable for use as food (Akunjili Umeaku, Chris-Umeaku, Emmyegbe, & Okeke, 2018). Meat has a very high nutritional value and moisture content with pH value of 5.4 (Laurie in Umeaku, Chris-Umeaku, Emmyegbe, & Okeke, 2018).

Meat plays an important role in human diet by contributing both macro and micro nutrients that are required for growth and good health maintenance. The rate of increase in per capita consumption of meat was found to be very high in developed countries when compared with developing nations. (Anjaneyulu, Thomas, & Kondaiah, 2007). Meat is high in nutrients, but very prone to spoilage and to prevent this from occurring, value addition to meat is essential (Anna, Lackshmannan, Mendiratta, Anjaneyulu, & Bisht, 2005). This involves processing and preservation of meat so as to prolong its shelf-life and improve its acceptability. (Eyas-Ahmed, Anjaneyulu, Thomas, & Kondaiah, 2006). Processing aids in producing varieties and convenient meat products in order to meet various lifestyle requirements, while preservation aided by processing extend the shelf-life of meat and meat products (Sharma & Kondaiah, 2005), the need for effective,

cheap and simple preservative techniques cannot be ignored. These techniques include intermediate moisture food processing such as suya. (Omojola, 2008).

Suya is a very popular indigenous meat product in terms of frequency of consumption in northern Nigeria. Its popularity has now extended to southern part of Nigeria. It is a traditionally processed, ready-to-eat Nigerian meat product, which has a wide acceptance and has become a mass consumer product. The numbers of producers as well as consumers have, therefore, increased tremendously irrespective of ethnicity, religion, social status or sex (Igene in Iliyasu, Iheanacho, & Mshelia, 2008). These meat products have formed the basis of the Nigerian livestock industry, which provides employment and income to the populace. Consequently, its production has become a major economic activity in Nigeria, Cameroon, Senegal, Mali and Chad Republic (Igene & Agboola in Iliyasu, Iheanacho, & Mshelia, 2008). There are, however, three main forms of Suya, namely Tsire, Kilishi and Balangu. Tsire is roasted, boneless mutton, beef or goat meat that is cooked around a glowing fire in which the meat pieces are staked on wooden sticks (Alonge & Hiko in Iliyasu, Iheanacho, & Mshelia, 2008).

Kilishi is usually prepared from different types of meat such as beef and mutton. Beef, however, is mostly used for its preparation. Of the three forms of Suya, Tsire is the most commonly preferred to most consumers and is synonymous with Suya (Igene & Abulu Iliyasu, Iheanacho, & Mshelia, 2008). Suya producers are also the marketers. They prepare and retail it along streets, at clubhouse, restaurants, airports, institutions, picnics, doorsteps of houses and offices in order to make accessibility easier. It is generally used as travel, convenience or leisure food. In many cases, it is not consumed immediately it is prepared. It is held and reheated before serving. This is because consumers insist on eating Suya while it is still hot (Igene & Mohammed in Iliyasu, Iheanacho, & Mshelia, 2008).

Kilishi (Nigerian beef cracker) is a tropical intermediate moisture meat product prepared from beef slices, infused in slurry of groundnut paste and spices and sun-dried. Kilishi is comparable to other beef crackers produced and eaten across the globe (Rahman, Salman, Kadim, Mothershaw, Al-Riziqi, Guizani, Mahgoub, & Ali, 2005). Kilishi is a sun dried spiced and grilled meat snack that can be kept for considerably long time without getting spoiled due to its dry nature. Application of spice is one of the most important stages during the production of kilishi because it is a critical control point (Shamsuddeen & Ameh, 2008). Balangu is one of the traditionally prepared meat products produced and widely consumed in Northern Nigeria. It is produced by spreading raw meat on wire gauze and

roasted on barbeque with addition of seasoning and oil. (Shamsuddeen & Ameh, 2008).

Geographical Information System (GIS) is a technology that provides the means to collect and use geographic data to assist in the development of Agriculture. A digital map is generally of much greater value than the same map printed on a paper as the digital version can be combined with other sources of data for analysing information with a graphical presentation. The GIS software makes it possible to synthesize large amounts of different data, combining different layers of information to manage and retrieve the data in a more useful manner. GIS provides a powerful means for agricultural scientists to better service to the farmers and farming community in answering their query and helping in a better decision making to implement planning activities for the development of agriculture. (National Institute of Agricultural Extension Management, 2019).

A Geographical Information System (GIS) is a system for capturing, storing, analyzing and managing data and associated attributes, which are spatially referenced to the Earth. The geographical information system is also called as a geographic information system or geospatial information system. It is an information system capable of integrating, storing, editing, analyzing, sharing, and displaying geographically referenced information. In a more generic sense, GIS is a software tool that allows users to create interactive queries, analyze the spatial information, edit data, maps, and present the results of all these operations. GIS technology is becoming essential tool to combine various maps and remote sensing information to generate various models, which are used in real time environment. (National Institute of Agricultural Extension Management, 2019).

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver. The GPS is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defence. GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS. (Civil

Simplified, 2016). Barbecues such as kilishi and suya are found in almost every corners and streets of Bauchi town but they cannot be easily located by first comers or tourists to the state. It is in the light of this, that this study tries to design and create a spatial database containing spatial and attribute data/information that are useful in locating barbecue spots using GIS.

### **Aims**

The aim of this study is to locate, design and create a spatial database containing spatial and attribute data information about the barbecue spots within Bauchi metropolis.

### **Objectives**

The aim of this study can be achieved through the following objectives:

1. To obtain the map of the study area.
2. To obtain the coordinates of at least four points on ground which are clearly identified on the map and geo-referenced.
3. To capture the coordinates of points using GPS.
4. To obtain the attribute data/information about the produce by means of questionnaire.
5. To plot the points.

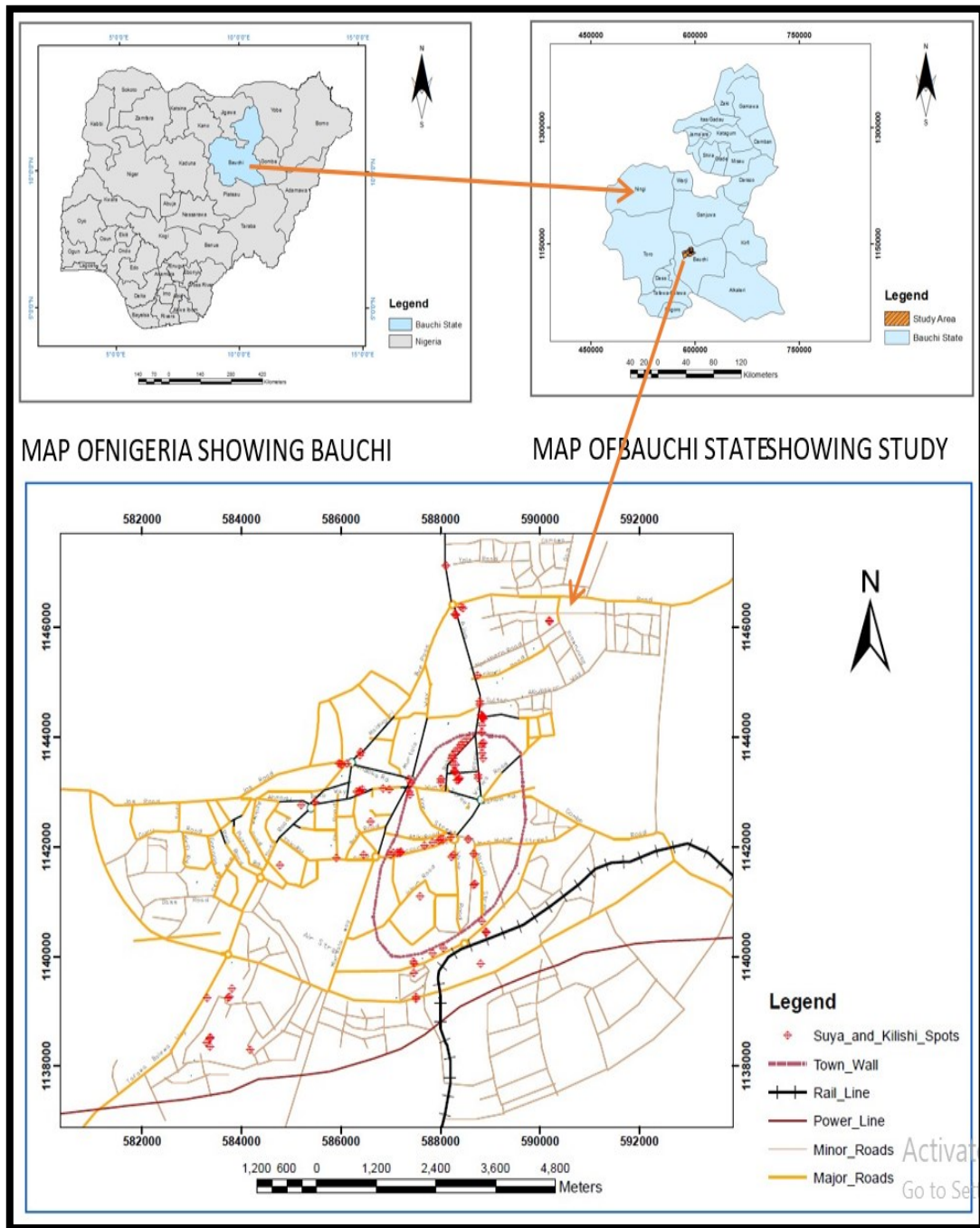
### **The scope of the study**

This study covers an area of about 186km<sup>2</sup> within Bauchi metropolis.

### **Study Area**

The study area is Bauchi metropolis of Bauchi state. It is located within the longitude 09° 46' to 09° 54' E and Latitude 10° 15' to 10° 23' N. Bauchi town lies on the watershed of many watercourses flowing away from the town in all directions. There is much exposed rock and in many cases it is close to the surface creating drainage problems. Bauchi town is strategically placed on the junction of the Jos–Bauchi–Gombe and Jos–Bauchi–Maiduguri trunk “A” roads. The improvement of Bauchi–Dass road to the south and Bauchi–Ningi road to the North has increased the importance of Bauchi as a distribution centre in addition to its traditional position as an administrative centre. Bauchi population as at two decades ago was about Three Hundred Thousand (300,000). (National Population Commission, 2006).





### Methodology

The methodology adopted consist of reconnaissance survey, office and field reconnaissance. Reconnaissance is the planning of the study at both office and the field before the commencement of the study (Nsemeke, 2010).

The aim of the reconnaissance survey is to provide information from where it is possible to understand the problems that may likely be encountered and to assist in finding a suitable solution. Office reconnaissance is the general study and compilation of information about the study by surveyors and the determination of the expected accuracy, type of instrument needed, the cost, number of personnel, topographical map, and the number of days. Field reconnaissance involves going round the study area to identify the physical locations of the features on the map that exist on the ground. During the field reconnaissance, the positions of the controls were checked.

Data were collected from Bauchi street guide map. Handheld GPS was used to pick the points on ground. A nineteenth-item questionnaire was distributed to the barbecue producers, and the data collected were encoded into the computer in a readable form and written to the database. The points collected using GPS were plotted using AutoCAD 2001 and exported to Arc View 3.2a.

## Results

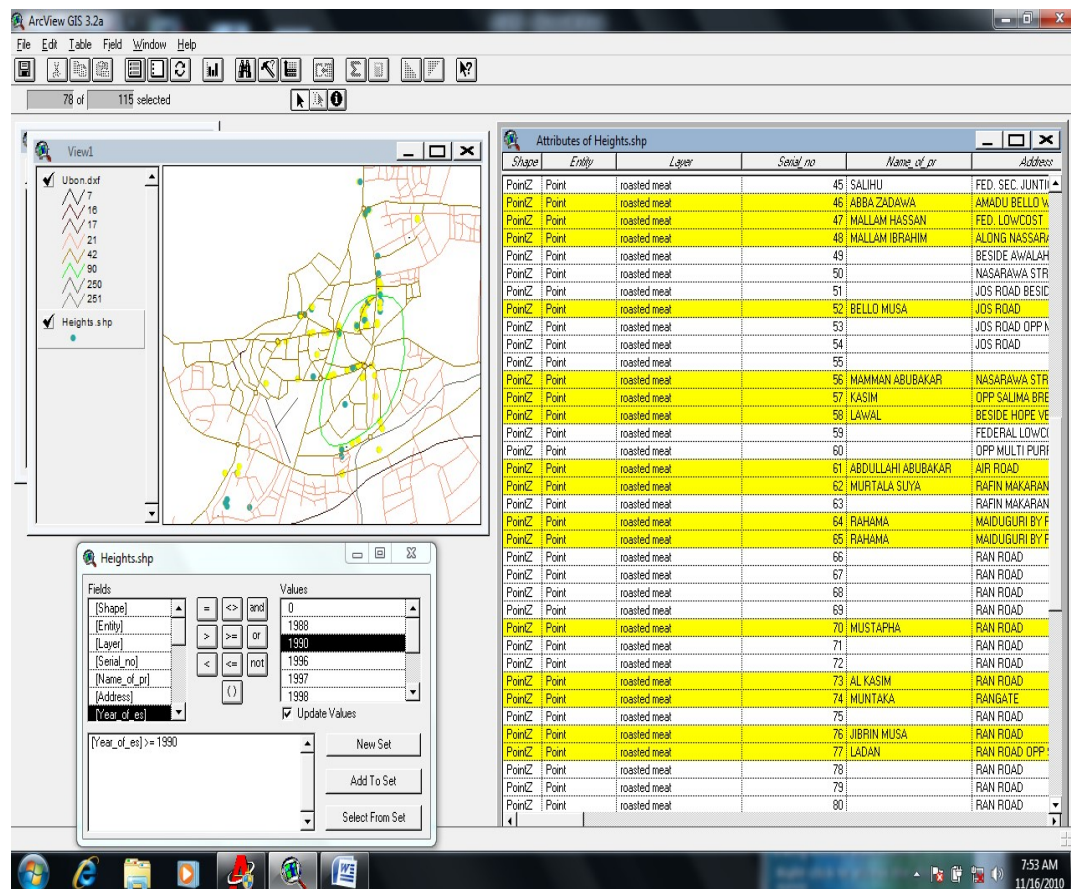


Fig. 1: Query Showing Barbecue Spots Established from 1990 To 2018. (Source: Authors)

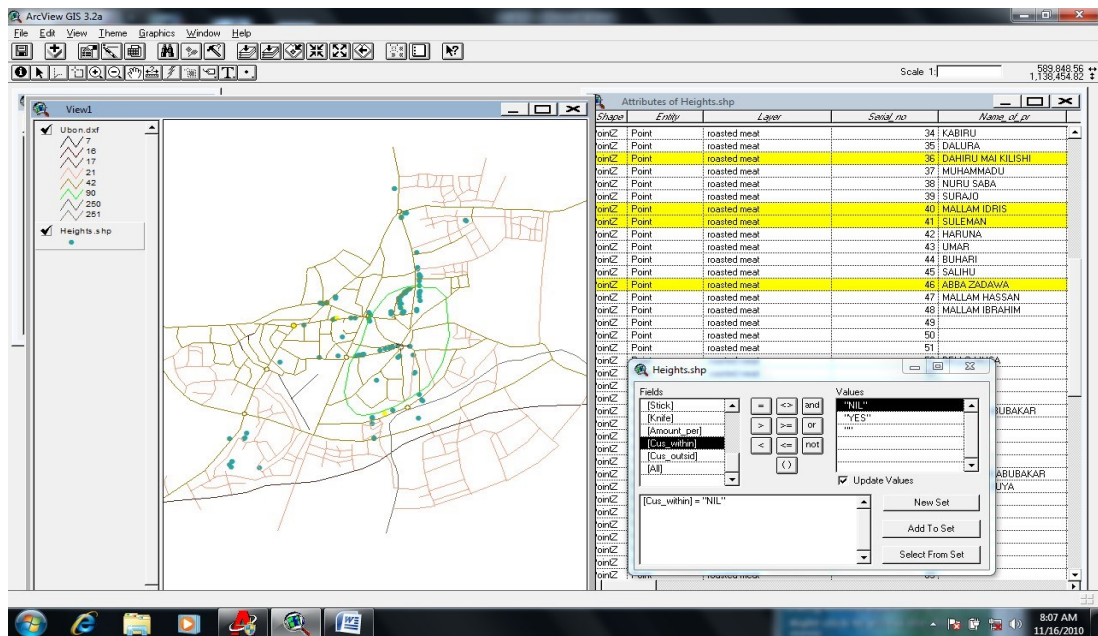


Fig. 2

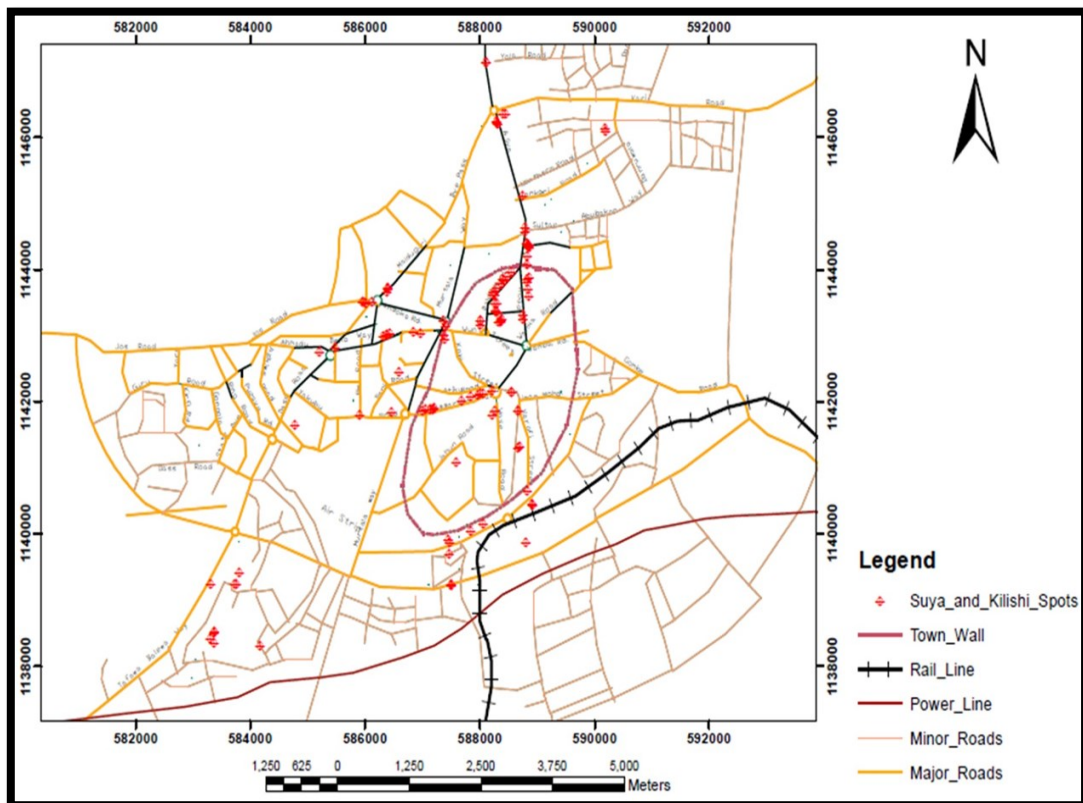


Fig. 3: Map Showing Suya and Kilishi Spots in Bauchhi Metropolis (Source: Authors).



## Conclusion

In conclusion, there is no denying the fact that barbecue is nutritiously important to the biological development of human beings, revenue generation, tourism and in reducing unemployment that boost national development.

## Recommendations

The study recommends the following:

1. The Bauchi State Government should provide soft loan to those that are into the business of barbecue. So as to encourage them.
2. A compendium of barbecue location should be made available in hotels and other recreational areas.
3. Association for people involved in barbecue business should be formed in order to promote the interests of her members.
4. Special location should be provided for the business for easier accessibility by the customers.

## References

- Anjaneyulu, A. S. R., Thomas, R., & Kondaiah. (2007). Technologies for Value Added Buffalo meat products-A Review. *Ame J. Food Tech.*, 2(3), 104-114. <http://dx.doi.org/10.3923/ajft.2007.104.114>
- Anna, A. M., Lackshmannan, V., Mendiratta, S. K., Anjaneyulu, A. S. R., & Bisht, G. S. (2005). Development and quality characteristics of extruded tripe snack from buffalo rumen meat and corn flour. *J. Food Sci. Technol.*, 42, 263-267.
- Civil Simplified. (2016). What is GPS? Retrieved from <https://www.civilsimplified.com/resources/what-is-gps>
- Eyas Ahmed, M., Anjaneyulu, A. S. R., Thomas, R., & Kondaiah, N. (2006). Effect of enrobing on the quality and shelf-life of buffalo meat cutlets under frozen storage. *J. Muscle Foods*.
- Frazier, W. C., and Westhoff, D. C. (2005). *Food Microbiology*, 4th edition. Tata McGraw hill, New Delhi, India. pp. 30-521.
- Iheagwara, M. C., & Okonkwo, T. M. (2016). Effect of processing techniques on the microbiological quality of kilishi – a traditional Nigerian dried beef product. *Journal of Meat Science and Technology*, 4(1): 11-17.
- Iliyasu, A., Iheanacho, A. C., & Mshelia, S. I. (2008). Profitability Analysis of Three Methods of Suya Production and Marketing in Maiduguri metropolitan Council, Borno State, Nigeria. *Nigerian Journal of Basic and Applied Sciences*, 16(2).
- Mayr, D; Margesin, R., Klingsbichel, E., Hartungen, E., Jenewein, D. D., Schinner, F., & Markl, T. D. (2003). Rapid Detection of Meat Spoilage by Measuring Volatile Organic Compounds by Using Proton Transfer Reaction Mass Spectrometry. *Appl. Env. Microbiol.* 69: 4697 – 4705.
- Melina, R. (2010). What's the history of the barbecue? Retrieved from <https://www.livescience.com/32724-whats-the-history-of-the-barbecue.html>
- National Institute of Agricultural Extension Management. (2019). Geographical Information Systems (GIS) - manage. Retrieved from <https://www.manage.gov.in/studymaterial/GIS>
- Nsemeke, U. U. (2010). Location of suya and kilishi spots.
- Olusola OO, Okubango AO and Omojola AB (2012). Nutritive and organoleptic characteristics of Kilishi as affected by meat type and ingredients formulation. *Journal of Animal Production Advances*, 2(5): 221-232.
- Omojola, A. B. (2008). Yield and Organoleptic Characteristics of Suya (an intermediate moisture meat) prepared from three different muscles of a matured bull. *Afr. J. Biotech.*, 7(13), 2254-2257.
- Rahman, M. S., Salman, Z., Kadim, I. T., Mothershaw, A., Al-Riziqi, M. H., Guizani, N., Mahgoub, N., & Ali, A. (2005). Microbial and physio-chemical characteristics of dried meat processed by different methods. *International Journal of Food Engineering*, 1(2): 39.
- Shamsuddeen U., & Ameh J. B. (2008): Survey on the possible critical control points in kilishi (a traditional dried and grilled meat snack) produced in Kano. *International Journal of Bioscience*. 3(2): 34-38.
- Shamsuddeen, U., & Ameh, J. B. (2008). Survey on the possible critical control points during the production of balangu of in Kano. *Bayero Journal of Pure and Applied Sciences*, 1(1):76– 79.
- Sharma, B. D., & Kondaiah, N. (2005). Development of Buffalo meat samosa and evaluation of its storage in low vacuum Family Park under frozen condition. *J. Vet. Pub. Health*, 3, 59-62.
- Umeaku, C. N., Chirs-Umeaku, C. I., & Emmyegbe, I. O., Okeke, U. C. (2018). Bacteriological quality of ready-to-eat meat (smoked and kilishi) sold in Nigerian markets. *International Journal of Microbiology and Biotechnology*, 3(2): 57-61