APR -26

A Survey of Ready-To-Eat Meat Products Available in Kebbi and Sokoto States, Nigeria: A Consumer Approach

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Abstract
A survey study was designed and investigated the popularity of various ready-to-eat meat products (RTE-MPs) available in Kebbi and Sokoto States, Nigeria. States metropolis and major towns on the Trunk 'A1 and A26' Federal highway cutting across the states ware used as the sampling frame where 391 respondents (consumers) were randomly interviewed using a structured interview schedule between January and March 2015. Subjects were guided to mention the known RTE-MPs available in their localities and recorded. The responses were translated into scores and subjected to nonparametric descriptive statistics. The means were analysed in GLM Univariate ANOVA using SPSS (16.0) and separated by Tukey test to determine the popularity levels of RTE-MPs.Results indicated significant differences ($p<0.05$) between the popularity of the RTE-MPs among consumers. *Balangu*, *tsire* and *kilishi* were statistically the same and more popular with mean scores (1.00, 0.98 and 0.98) respectively, among other RTE-MPs. *Gurunkaza, langabu* and *dambunnama* were more popular (0.78, 0.58 and 0.46) respectively than *soye* and meat pie which recorded the least points (0.28 and 0.19) respectively. The study also found out that same product could have different names depending on the locality. *Balangu* was referred to as "agashe", "gade" and "suya"; similarly, *langabu* was called "ragadada" and "ganda"; *soye* was also named "mazakwai";*kilishi* and *tsire* were referred to as "suya". The study concluded that though various RTE-MPs were produced and cherished in some localities, *Balangu*, *tsire* and *kilishi* were found to be more popular across the study area.

Keywords: Survey, ready-to-eat meat products, consumer approach, popularity

Introduction
Ready to eat meats are defined by the FSANZ(2011) and FSAI(2005) as meat products intended to be consumed without further heating or cooking and includes: cooked or uncooked fermented meat, Pâté, dried meat, slow cured meat, luncheon meat, cooked cured or uncured muscle meat. In Nigeria, RTE-MPs including intermediate moisture meats like *balangu, tsire, guru* and dried meat products like *kilishi, dambunnama, banda*, were reported to be highly appreciated because of their characteristic taste, texture and storage stability (Fakolade and Omojola, 2010; Jibir *et al*., 2013; Ribah *et al*., 2013). Awaisheh, (2010) reported that the popularity and demand for RTE-MPs have greatly increased around the world in recent years.According to Inyang*et al*. (2004), *suya* production has boomed as it is consumed throughout Nigeria and even extended to other countries. Many varieties of RTE-MPs are available to consumers of which some might not be as popularas others to the generality of the consuming public, as varieties can be seen in towns along transit routes.

It is based on this that the study was designed to determine the types of RTE-MPs available and their levels of popularity in the study area.

Materials and Methods
The study was conducted in Kebbi and Sokoto States, North-West region of Nigeria. The Trunk 'A' Highway (A1 and A126) cutting across the study area served as the Transect along which RTE-MP consumers were sampled. The sampling frame comprised of all the Metropolitan and Local Government headquarters along the Transect including; BirninYauri, Yelwa, koko, Maiyama, Jega, Kalgo, BirninKebbi, Ambursa, Aliero, Tambuwal/Kajiji, Shagari, Bodinga, Sokoto and Dange/Tureta. Between January and March 2015, a total of 391 consumers (respondents) were randomly interviewed across the study area. Using the principle of proportionate sampling (sampling with proportional to size), 221 of the respondents were drawn from Kebbi State having twice as much of sampling locations along the Transect, and 170 respondents from Sokoto State. Random sampling was employed to administer the face to face interview schedule. A minimum of 10 consumers (respondents)

were interviewed from the location having the least number of processors and then proportionately increase the number of respondents according to the number of processors for each sampling location.

A total of 391 respondents were interviewed and asked to list the RTE-MPs known to them in their individual localities. The list of all RTE-MPs identified by respondents was provided and analyzed using nonparametric descriptive statistics model for frequencies, percentages, means and standard deviation. Means were subjected to General Linear Model univariate analysis of variance (GLM Univariate ANOVA) and significant means were separated by Tukey test at 5% level of significance using SPSS 16.0 to determine the relative popularity of the RTE-MPs among the consumers.

Results and Discussion

Table 1 presents the results for consumer responses on the popularity of various ready-to-eat meat products in the study area. Results indicated a significant difference ($p<0.05$) in popularity of the various RTE-MPs among the consumers. *Balangu*, *tsire* and *kilishi* were statistically the same and more popular (1.00, 0.98 and 0.98) respectively, among other RTE-MPs. *Gurunkaza, langabu* and *dambunnama* were more popular (0.78, 0.58 and 0.46) respectively than *soye* and meat pie which recorded the least (0.28 and 0.19) respectively.

Table 1: Consumer responses on popularity of various ready-to-eat meat products (RTE-MPS)

RTE-MPs	No. of Resp.	*Freq.	Popularity (%)	Mean	Standard Deviation	ANOVA
Balangu/Agashe/Suya/Gade	391	391	19.10	1.00	0.000	1.00[a]
Kilishi	391	382	18.10	0.98	0.150	0.98[a]
Tsire/suya	391	384	18.70	0.98	0.133	0.98[a]
Gurunkaza/Tantabara/Zabo	391	305	15.00	0.78	0.415	0.78[b]
Langabu/Ragadada/Ganda	391	225	11.00	0.58	0.495	0.58[c]
Dambunnama	391	179	8.70	0.46	0.499	0.46[d]
Soye/Mazakwai	391	110	5.40	0.28	0.450	0.28[e]
Meatpie/Meatballs	391	75	4.00	0.19	0.394	0.19[e]
Total		*2051	100			
Standard Error						0.024

a,b,c,d,e, = means with different superscript along the same column within a subset differ significantly($p<0.05$), *Multiple responses recorded

The current study found out that *Balangu*, *tsire* and *kilishi* were more popular with means of (1.00, 0.98 and 0.98) respectively. Iliyasu *et al*. (2008), Abubakar *et al.* (2011) has classified the trio under a general term "suya*"*. Apart from the general name "suya", the current study found out that *balangu,* specifically, has other alternative names such as "agashe" and "gade" depending on localities. Abdullahi *et al*. (2004), Abubakar *et al.* (2011) reported that *suya* is a popular, traditionally processed ready to eat Nigerian meat product, originally produced from beef and later extended to other ruminant animals, and in recent years, non-ruminant animals are being utilized in *suya* making. Olusola *et al.* (2012) reported that *kilishi* is a popular meat variety in northern Nigeria. Uzeh *et al*. (2012) reported that *tsire* is a popular delicacy in Nigeria.

*Gurunkaza/tantabara/zabo*is a Hausa name for roasted chicken/pigeon/guinea fowl respectively, and was found to be (0.78) popular among consumers in the current study. There is a paucity of information regarding this popular product but its existence is practically evident from the roadside stalls and grills across the study area. Ologhobo*etal*. (2010) pointed out that in Nigeria, sale of beef *suya* first started before that of chicken, which emerged just recently and is not as widespread as the beef *suya*.This product *langabu* with its alternative names "ragadada" or "ganda", gathered from the current research, is synonymous to the popular *ponmo* of the southern Nigeria. The product rated (0.58) popularity among consumers. This indicates that the product is popular even in the north. It is basically the dehaired and boiled cow skin, head, legs and tail.

Joseph (2006) noted that the product is fast becoming fast consumer product. The limitation of using the product as food has been however argued since cow skin is composed only of collagen as reported by Lehninger (1977) and hence, low biological value. Akwetey *et al*. (2013) reported that ponmo or "welle" is a delicacy of the south-west Nigeria and Ghana. However, its popularity has spread to all over Nigeria with different societies having a unique mode of processing. *Dambunnama* is a shredded meat product (meat floss) that is produced from pure lean meat of ruminants, poultry, rabbit and fish. The products' popularity in the current studies was (0.46) which makes it relatively more popular than meat pie and soye. The reason for its low popularity could be

as a result of its production process, where only mostly in municipals the products are found. Evident of its popularity is the several scientific researches (Ogunsola and Omojola (2008; Salihu *et al.* (2010 and Huda *et al*., 2012) conducted on the product for different purposes. *Soye* referred to spiced fried lean meat produced from ruminant animals. The product and was found to be low in popularity (0.28) by the current research. The reason for this product to have a low popularity could be due to the fact that the product is seldom commercially produced. The current study reported the popularity of meat pie to be the least (0.19) among the identified products. Unlike *soye* which was reported in this study to have scarce scientific information, meat pies are popular products in municipals as snacks. The presence of several studies (Gill, 1996; Thomas and Masters, 1988; Falola *et al*., 2011 and Eluma *et al.* (2015) conducted for other purposes indicates the scientific popularity of the product.

Conclusion

It was concluded from the study that eight major ready-to-eat meat products were found to be more popular in the study area. It was also found out that *Balangu*, *tsire* and *kilishi* were more popular than the other listed products. Also, some products could have alternative names depending on the locality. For example *Balangu* was referred to as "agashe", "gade" and "suya". Similarly, *langabu* was called "ragadada" and "ganda".*Soye* was also named "mazakwai". *Kilishi* and *tsire* were referred to as "suya".

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