

PROXIMATE COMPOSITION OF SOME COMMONLY CONSUMED INDIGENOUS MEAT SPICES IN NIGERIA

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ABSTRACT

Consumers' preference is currently towards foods with good health benefits and organoleptic attributes. Proximate composition of some commonly consumed indigenous meat spices in Nigeria was investigated. The spices are ginger (*Zingiber officinale*), garlic (*Allium sativum*), onion (*Allium cepa*), curry (*Murraya koenigii*) and thyme (*Thymus vulgaris*). The result of proximate analysis showed that the spices on dry weight basis contained moisture ranging from 4.34% in thyme to 9.78% in onion; ash content ranged from 2.40% (onion) to 12.2% (curry). The crude protein content ranged from 6.34% in garlic to 11.58% in curry, while crude fat was from 0.83% (garlic) to 15.06% in onion. The fibre content of the spices also ranged from 2.10% in garlic to 15.48% in thyme. The total carbohydrate (nitrogen free extract) ranged from 39.37% in curry to 76.61% in onion. These spices are sources of nutrients with higher percentage of carbohydrates. Therefore, indigenous spices should be used as dietary component especially when cooking meat, and not only as mere food adjuncts.

Keywords: Proximate composition, indigenous meat spices, Nigeria.

INTRODUCTION

The increasing demand for meat and variety of meat products has far outstripped the supplies as a result of rapid human population and change in life style (Sofi *et al.*, 2010).

Meat is high in nutrients; however, value addition is essential so as to improve the flavour, overall acceptability and prolong its shelf-life (Eyas Ahmed *et al.*, 2006). Health conscious consumers are wary of potential dangers of consuming chemically synthetic products as a result of speculations that manufactured seasonings are directly or indirectly responsible for the prevalence of some diseases which are the major causes of morbidity in Nigeria. There is therefore the need for utilization of effective and natural alternatives such as herbs and spices to enhance flavour, extend shelf-life, and increase overall quality of foods as well as improve health of consumers (Tajkarimi *et al.*, 2010).

Spices are plants or plant materials commonly used in most Nigerian dishes as flavour, colour enhancer and natural preservatives in foods, meats and beverages (Teye *et al.*, 2013). Spices and condiments are also used as preservatives, appetizers and to garnishing meat and meat products as well as to prevent decomposition by microbial growth or undesirable chemical changes (Gyesley, 2008). They are either used as whole, ground in processed state or in form of extracts (oils and oleoresins). In culinary concerns, spices give piquancy to tasteless food served in homes, cafés and restaurants.

Commonly consumed indigenous spices in Nigeria include garlic, ginger, onion, curry and thyme, pepper, nutmeg and cinnamon. Ginger (*Zingiber officinale*) is a major aromatic herb grown in Nigeria as a rhizome with sweet, strongly aromatic and sharp pungent flavour. The consumption of ginger in meat led to reduction in blood cholesterol and also served as

a potential anti-inflammatory and antithrombotic agent (Thomson *et al.*, 2002).

Garlic (*Allium sativum*) has a characteristic pungent, spicy flavour that mellows and sweetens considerably with cooking with various meat types (Tang and Cronin, 2007). It is well known as a seasoning for food flavouring and as a therapeutic agent for the prevention and treatment of an array of diseases due to its antibacterial, fungicidal, virucidal, antioxidant, anti-inflammatory, antiseptic, anti-ageing and heavy metal detoxifier effects (NCCIH, 2016).

Onions (*Allium cepa*) are consumed raw or cooked either as young green plants (leaves) or as bulbs. They are valued for their distinctive pungency and flavour which improve the taste of foods.

Curry leaf (*Murraya koenigii*) is an inevitable part of spicing up dishes used in small quantities for their distinct aroma due to the presence of volatile oil and their ability to improve digestion. It contains essential oils, coumarins, terpenoids, carbazole alkaloids, vitamins, α -tocopherol, β -carotene, and lutein (Choudhury and Garg, 2007), with antioxidant hypoglycemic, anticarcinogenic and antimicrobial properties (Ningappa *et al.*, 2008).

Thyme (*Thymus vulgaris*) is a pleasant smelling perennial herb used traditionally for several culinary and medicinal purposes. It is an expectorant and has antiseptic, antimicrobial and antioxidant actions; lowers cholesterol levels; and eliminates scalp itching and flaking caused by candidiasis (Lingenfelter, 2011). This study aimed to compare the proximate composition of some commonly consumed indigenous meat spices in Nigeria.

MATERIALS AND METHODS

Collection of samples

Samples of ginger (*Zingiber officinale*), garlic (*Allium sativum*), onion (*Allium cepa*), curry (*Murraya koenigii*) and thyme leaves (*Thymus vulgaris*) were purchased fresh without any physical defect from local market within Abeokuta, Ogun State, Nigeria.

Processing of samples

The outer skin of ginger rhizome was peeled with knife, while the outer scaly leaves of whole garlic bulb were also removed. Also, the scaly leaves of onion bulbs were removed, and the top-bottom section was obtained by slicing off about

5mm of the top and bottom ends of the onion bulbs. These samples were then cut into smaller pieces and oven-dried at 60°C for 48 hours.

Freshly harvested curry and thyme leaves were washed in water and freeze-dried. Thereafter, dried samples of spices were finely ground to powder separately and stored at 4°C for further analysis.

Determination of proximate composition

Proximate constituents of dried samples of spices were analyzed for moisture, crude fat, crude protein, and ash in accordance with the official methods of the Association of Official Analytical Chemists (AOAC, 2003). Total carbohydrates were estimated by difference: $100 - (\% \text{ moisture} + \% \text{ crude protein} + \% \text{ crude fat} + \% \text{ ash content})$.

RESULTS AND DISCUSSION

The results of proximate composition of samples of indigenous meat spices are shown in Table 1. Moisture content of the samples ranged from 4.34% in thyme to 9.78% in onion. High moisture content of *Allium cepa* underscored its perishability and susceptibility to microbial spoilage and the need for proper preservation. However, low moisture content of thyme indicated its possible long shelf-life. Ash provides an insight into the nutritionally important inorganic mineral elements contained in foods (Edeogu *et al.*, 2007). The value of ash obtained in curry (12.2%) revealed it as a promising source of mineral elements. The protein content of garlic (6.34%) obtained is similar to what was reported by the USDA nutrient database (6.39%) (USDA). Garlic is preferred as spice due to its low amount of crude fat (0.83%) which helps to reduce the risk of cardiovascular diseases and aging (Bamishaiye *et al.*, 2011). Thyme (*Thymus vulgaris*) contained high percentage of dietary fibre (15.48%). Dietary fibre lowers cholesterol level, risk of coronary heart disease, diabetes and cancer (Ishida *et al.*, 2000). Crude fiber in diets stimulates the contraction of muscular walls of the digestive tract, thus counteracting constipation and elimination of wastes (Ponnusamy and Vellaichamy, 2012). The spice samples were found to be good sources of carbohydrates. Onion had the highest concentration of nitrogen free extract (76.61%)

as compared to thyme which had the lowest concentration (45.02%).

CONCLUSION

Spices are essential ingredients used to enhance the colour, flavour and palatability of Nigerian dishes. However, indigenous spices (ginger, garlic, onion, curry and thyme) have not only flavouring attributes, but also serve as sources of essential nutrients when used in cooking meat.

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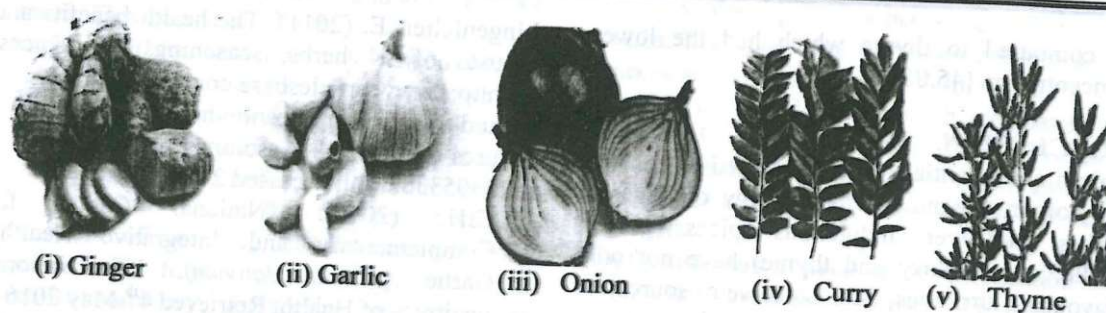


Figure 1: Some commonly consumed indigenous meat spices in Nigeria

Table 1: Proximate composition of ginger, garlic, onion, curry and thyme

Parameter	Composition (%)					SEM
	Ginger	Garlic	Onion	Curry	Thyme	
Moisture	8.70 ^b	7.55 ^c	9.78 ^a	6.84 ^d	4.34 ^e	0.55
Ash	6.30 ^c	5.10 ^d	2.40 ^e	12.20 ^a	11.00 ^b	0.09
Crude protein	8.58 ^c	6.34 ^d	9.45 ^b	11.58 ^a	9.39 ^b	0.04
Crude fat	5.35 ^b	0.83 ^d	15.60 ^a	5.44 ^b	4.64 ^c	1.31
Crude fibre	3.25 ^c	2.10 ^e	6.03 ^b	2.50 ^d	15.48 ^a	1.33
Nitrogen free extract	72.76 ^c	73.07 ^b	76.61 ^a	39.37 ^e	45.02 ^d	4.23

a, b, c, d, e: Means on the same row with different superscripts are significantly ($p < 0.05$) different
SEM: Standard Error of Mean