# PROXIMATE COMPOSITION OF GINGER ROOT AND GARLIC BULB POWDER FOR MEAT PROCESSING IN EDO STATE

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***ABSTRACT***
*The study conducted investigation on proximate composition of ginger root and garlic bulb powder as phytobiotics for processing meat in Edo State. The copped ginger root and garlic bulb were sun dried for three weeks, milled separately into powder form using a milling machine with particle of 0.15mm sieve powder size. It was established that the moisture content of ginger root and garlic bulb powder were (22.5, 48.00 %), crude fiber (5.50, 3.00%), Ash (8.00, 6.00 %), crude protein (9.10,16.28%),ether extract (7.00,5.00%) and nitrogen free extract (70.40,69.72%). The analysis of ginger and garlic used in this study showed that ginger and garlic contained considerable amount of crude protein (CP) and thus can be used to augment protein content of poultry products.*
**Keywords: Ginger root, Garlic bulb, Crude fibre, Crude Protein and Proximate.**

## *INTRODUCTION*

Poultry production in the developing countries has been gaining popularity due to its contribution to meeting protein requirement of man, job creation, as well as socio-cultural and religious functions. According to Oboh and Igene (2006), poultry industry in Nigeria comprises of production of chickens, turkeys, ducks, and pigeons to mention a few. 84% of these are indigenous and 16% are exotic groups (Food and Agricultural Organization, FAO, 2008). Antibiotics as feed additives are widely used as therapeutic agent and also as growth promoters in poultry production all over the world but over the years, there has been growing concern about the public health risk resulting from antibiotic resistance. Antibiotics sometimes cause drug interactions that make medication ineffective, cause side effects or cause damage to a patient's biological systems. Mixing alcohol with antibiotics may decrease their effectiveness or may cause nausea, vomiting and respiratory effects. Antibiotics sometimes make birth control pills ineffective. Carcinogenic responses and other side effects of antibiotic residues in poultry products and meat make its use a serious call for concern. The extensive use of antibiotic growth promoters in poultry industry has resulted in rapid appearance of resistant form of microorganisms less sensitive to antibiotics (Sudipto, 2010). Over the years, there has been need for the use of alternative form of antibiotics and spices and some plant leaves have been found to be phytobiotic and various researchers have reported their success stories. Otoikhian, Emakpo and Imasuen (2007) for example, reported that ginger can successfully be used as a phytobiotic substance in poultry production. Natural products plant origin like spices, herbs and many plant extracts can be considered as alternative to antibiotics as well as growth promoters in improving broiler performance (Fenelli, Castro, Toranzo and Castro, 1998). Garlic is active against microorganisms that are resistant to synthetic antibiotics and the combination of garlic extracts with antibiotics has been reported to lead to partial and total synergism (Didry, Dubreuil, and Pinkas, 1992). Ginger is used worldwide as a cooking spice, condiment and herbal remedy. The Chinese have used ginger as a spice in processing broiler meat for at least 2,500 years as a digestive aid and anti-nausea remedy and to treat bleeding disorders and rheumatism. It has also been used to treat baldness, toothache, snake bite and respiratory conditions (Duke and Ayensu, 1985). In Traditional Chinese Medicine (TCM), ginger is considered a pungent dry warming herb used for ailments triggered by cold and damp weather. Ginger is used extensively in *Ayurveda*, the traditional medicine of India, to block excessive clotting (i.e. heart disease), reduce cholesterol and fight arthritis. In Malaysia and Indonesia, ginger soup is given to nursing mothers for 30 days after their delivery to keep them warm and to help them sweat out impurities. In Arabian medicine, ginger is considered an aphrodisiac (Qureshi, Shah, Tariq and Ageel, 1989). Also, in Africa, it is believed that eating broiler meat processed with ginger regularly will help repel mosquitoes (Duke and Ayensu 1985). The Eclectic

physicians of the 19th century relied on ginger to induce sweating, improve the appetite and curb nausea, and as a tropical counterirritant. Garlic can rightfully be called one of nature's wonderful plants with healing power. Therefore using Garlic in processing broiler meat can inhibit and kill bacteria, fungi, lower blood pressure, blood cholesterol and blood sugar, prevent blood clotting, and contains anti-tumor properties. It can also boost the immune system to fight off potential disease and maintain human health (Abdullah, Kandil, Elkadi, and Carter, 1988). It has the ability to stimulate the lymphatic system which expedites the removal of waste products from the human body. It is also considered an effective antioxidant to protect cells against free radical damage. Garlic can help to prevent some forms of cancer, heart disease, strokes and viral infections (Galeone *et al.*, 2006). The white garlic is said to have medicinal properties while the black fermented garlic is more commonly used for cooking by the Japanese as results have shown that processing broiler meat with this black fermented garlic could result in drop in blood pressure, anti-aging, prevent blood clots, cancer prevention, fall in blood sugar, and enhances immunity of the body (Zhengzou Love Herb Company Limited, 2013).

## MATERIALS AND METHODS

The proximate analysis was carried out in Federal University of Agriculture Abeokuita, Ogun State. The ginger and garlic were milled separately into powder form. They were stored in air tight containers prior to the proximate analysis. Aliquet were taken for the proximate analysis which was determined, using the method described by AOAC (2000). The result is presented in the Table below.

## RESULT

### Proximate composition of ginger and garlic powder used in the study

The result of proximate composition of ginger root and garlic bulb powder used in the formulation of the experimental diets in this study is presented in Table 17. The ginger powder has 5.5% crude fibre, 8.00% crude ash, 9.10% crude protein, 7.00% ether extract and 70.40% Nitrogen free extract. Also the garlic bulb powder used in this study contained 3.00% crude fibre, 6.00% crude ash, 16.28% crude protein, 5.00% ether extract and 69.72% Nitrogen free extract.

**Table: Proximate Composition of Ginger and Garlic (g/100g)**

| Composition | Ginger | Garlic |
|---|---|---|
| Moisture (%) | 22.5 | 48.00 |
| Crude fibre (%) | 5.50 | 3.00 |
| Ash (%) | 8.00 | 6.00 |
| Crude protein (%) | 9.10 | 16.28 |
| Ether extract (%) | 7.00 | 5.00 |
| NFE | 70.40 | 69.72 |

## DISCUSSION

### Proximate Analysis of Ginger Root and Garlic Bulb Powder

The crude protein content of garlic is more than that of ginger and also more than the crude protein in maize. The values of CP obtained in ginger and garlic bulb powder used in this study were more than the values reported by Otunola et al. (2010). This may be due to different form of processing used in both studies. The high crude protein content of garlic may be due to the presence of active proteinous metabolites such as allicin. The additives also contained appreciable amount of fat and crude ash

which form the minerals that are inorganic components. Also, the low fibre contents in both additives imply that the additives can be used in the diets to complement total dietary fibre. Otunola et al. (2010) also observed low fibre contents in ginger, garlic and pepper.

## CONCLUSION

The analysis of ginger and garlic used in this study showed that ginger and garlic contained considerable amount of crude protein (CP) and thus can be used to augment protein content of poultry products.

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