

Consumption of Honey in Wa Municipality, Upper West Region Ghana

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ABSTRACT

Honey commonly referred to as 'liquid gold' is a sweet, thick liquid natural food produced by honeybees through secretions of living plants that transform and combine with specific substances of their own, and leave it in the honey comb to ripen and mature. Honey is spoken of by all religious books, and accepted by all generations, traditions and civilizations, both ancient and modern as very medicinal and nutritious food. The paper explored the source, brand and packaging of honey sold, the quality features of honey consumers look out for during purchase, average consumption (daily, weekly, monthly, yearly) of honey, health and nutritional benefits of honey and the concerns consumers have about honey purchased for consumption.

A consumer survey in peri-urban and urban communities in Wa Municipality was carried out. A total number of 400 consumers were accidentally sampled and consented for the study after verifying consumer's eligibility from a check list.

The study found out that, consumption of honey was common among urban and peri-urban dwellers thereby creates a business opportunity for producers, processors and vendors. Two major sources of honey were identified, wild and apiary honey. The brands identified were also the local and external honeys. Honey in the Municipality is packaged and sold in plastic/rubber bottle, recycled drinking water bottle and beer bottles for consumers. Honey consumers in the Wa municipality commonly use four quality characteristics (flavor, taste, color and thickness) in buying honey for use. They believe that these physical characteristics are all-inclusive in determining the quality of honey and stretches an upright conclusion of honey quality. The overall daily average quantity of honey consumed per person in Wa Municipality was calculated at 1.7 ml, weekly 11.9ml, monthly 47.6ml and yearly 571.2ml. In terms of access point of honey, consumers buy honey from processors, distributors and vendors. Majority of the consumers buy honey in recycled packaging materials. Additions of water, sugar and melted mattresses as well as grave honey are the adulteration perceptions raised by consumers.

Keywords- Consumption, Honey, Purchase, Quality

I. INTRODUCTION

Honey is a sweet, thick liquid made by honeybees. The bees collect sugar mainly the sugar-rich nectar of flowers from their environment. Once inside the beehive, they repeatedly consume, digest and regurgitate the nectar to form honey as end product, a liquid that serves as stored food for bees. Honey is harvested by the use of fire or live torches, which cause the death of bees. It can also be harvested through modern methods with causing bee death. Both practices exist in Ghana with much of the honey been harvested through the use of fire.

Globally, China was ranked the first among honey producing countries, with volume amounting to about 447 thousand metric tons of honey that year [1]. According to the report, the average annual production of honey worldwide was about 1.85 million metric tons in 2018[1]. This figure shows the forecast value of organic honey market worldwide in 2019 and provides a forecast for 2025. The global organic honey market had 606.2 million U.S. dollars in 2019, and was forecast to reach 923.6 million U.S. dollars by 2025 [1].

In Africa, Ethiopia has been ranked 1st and 10th in the world in relation to volumes of honey production. Ethiopia annual honey production was estimated to about 43,373 metric tons which is about 23.5% and 2.35% of African and world's honey production, respectively [2].

In general, honey production has been well-known as one of the most profitable ventures in various parts of the world, so much in use and as a result in demand that it can be termed a money spinner. Honey is one of humankind's oldest food products. It contains a number of nutritionally important substances that support good health and recovery. It is a characteristic sugary foodstuff; according to current regulations, apart from other forms of honey no other substances or additives can be added to it [3]. The fact that honey contains antioxidants, minerals, vitamins and proteins

makes it an appealing ingredient compared to artificial sweeteners [4]. This has triggered a demand for honey amongst health conscious consumers [4]. Honey is spoken of by all religious books, and accepted by all generations, traditions and civilizations, both ancient and modern as very nutritious food [5].

Medicinally, research indicates that honeys unique composition makes it useful as an antimicrobial agent and antioxidant. It also reduces skin inflammation, edema and exudation as well as promotes wound healing, diminishes scar size, and stimulates tissue regeneration [6]. It is also a known fact that honey ameliorates cardiovascular risk factors as well as being a potent inhibitor of *Helicobacter pylori*. Again, honeys express antimutagenic activity against bladder cancer and mammary carcinoma [6].

The demand for honey is based on a range of taste and preference criteria set in the mind of consumers who either reject or accept particular types of honey [7]. In a study on consumer consumption patterns influencing honey demand, honey quality was identified as a major driver of demand [4]. Quality was described based on characteristics such as sweetness, smoothness, taste, granulation, color and presence or absence of impurities [4].

In Ghana, there is general lack of records and documentation on honey production and consumption resulting into data gaps [8] however suggested an increasing trend in honey production in Ghana. The domestic production and demand gap in Ghana is consequently being bridged by high foreign imports of honey. There is therefore huge domestic market for honey in Ghana, which needs to be exploited. [9] Reported that ninety per cent (90 %) of the estimated annual world production of honey is consumed as honey, while the remaining ten per cent (10 %) is used industrially.

Also, [10] revealed that the annual honey consumption in the major honey producing and exporting countries (China and Argentina) is small: 0.1 to 0.2 kg per capita and higher in developed countries, where the home production does not always cover the market needs. He also reported that in the European Union (which is both a major honey importer and producer) the annual consumption per capita varies from medium (0.3 – 0.4 kg) in Italy, France, Great Britain, Denmark, Portugal to high (1 – 1.8 kg) in Germany, Austria, Switzerland, Hungary, Greece; while in overseas countries such as USA, Canada and Australia the average per capita consumption is 0.6 to 0.8 kg/year. However, consumption has been relatively stable over the last five (5) years. The domestic production and demand gap in Ghana is consequently being bridged by high foreign imports of honey. There is therefore huge domestic market for honey in Ghana which needs to be exploited.

II. METHODOLOGY

Study Area

Wa Municipality is located in Upper West Region of Ghana with administrative capital as Wa which also serves as the regional capital. The Wa Municipality shares administrative boundaries with Nadowli-Kaleo district to the north, Wa East district to the east and to the west and the south Wa- West district. It lies within latitudes 9°30'N to 2°28'N and longitudes 2°33'W to 10°20'W. It has a land area of approximately 579.86 square kilometers, which is about 6.4% of the Region. The population of Wa Municipal, according to the 2010 Population and Housing Census, is 107,214 representing 15.3 percent of the region's total population. Males constitute 49.7 percent and females represent 50.6 percent. Wa Municipality has over twenty communities with one urban town (Wa), there are other peri-urban communities (Kperisi, Bamahu, Kpongung and Charia) where this study was undertaken. Wa town was selected because of the larger population size that has most consumers in the municipal. It has the largest market of honey with many businesses. These communities were selected for consumption of honey study due to the cosmopolitan nature and the purchasing power of honey consumers revealed in preliminary field study. These communities are classified as peri-urban in the Wa Municipality with Wa being the only city in the municipality [11]. Consumption of honey is on rise in the peri-urban and urban centers due to their economic status. These five communities have most population of the municipal including tertiary and other students, public and private sector workers as well as most literate population in the municipality who consume honey. The municipal is described as cosmopolitan due to the numerous educational, economic, agricultural, public and private activities ongoing there with many different people living there. Figure 1 describes the study area of the study.

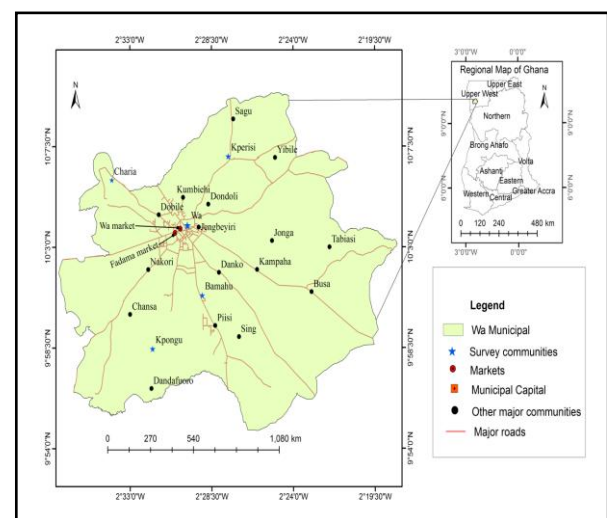


Figure 1: The Map of Wa Municipality

Method.

Honey consumer’s survey was carried out through a semi structured questionnaire. A total number of 400 consumers were accidentally sampled from Wa Municipality for the survey after validating their consumption status with a check list. This represented the sample size of the survey. The questionnaire was semi structured based on the research question, which is reflective of the objectives of the study and provided primary data from the sampled consumers for quantitative analysis. Statistical analyses was performed using Microsoft Excel and Statistical Package for Social Sciences (SPSS) version 21 Windows Professional.

III. RESULTS AND DISCUSSION

Socio-Demographic characteristics of survey consumers.

This section presents demographic features of surveyed consumers. These include; the age, sex, occupation and educational status of consumers. This will enable readers to appreciate the contextual and socio-demographic background of the unit of analysis. The survey gathered views of 400 consumers.

Table 1: Socio-demographic characteristics of consumers

Parameters	Category	Frequency (n=)	Percentage (%)
Gender	Male	231	57.8
	Female	169	42.3
Age group	Less than 20 years	31	7.8
	20-29 years	135	33.8
	30-39 years	141	35.3
	40-49 years	60	15
	50-59 years	20	5
	60 years above	13	3.3
Occupation	Farming	53	13.3
	Trade/Business	101	25.3
	Private sector	58	14.5
	Public sector	105	26.3
	Others	83	20.8
Education	No formal education	92	23
	Basic education	67	16.8
	Secondary/Tech/Voc	83	20.8
	Tertiary	158	39.5

Overall, the study constituted 231 males and 169 females. The study revealed that, males have purchasing ability than females in the Wa municipality. Economically, men are sound than females in the Wa municipality according to [13]. Preliminary field investigation shows that, ten (10) honey suppliers or producers are engaged in honey sale. Eight of these

vendors were women representing 80% of the total vendors whilst the remaining two were males representing 20% of the total number in Wa municipal. From this finding, women were the main vendors of honey in the Wa market. The survey indicates that all honey vendors are into business/trade as their main occupation and not engaged in other activities including farming, private sector employment and public sector employment.

This confirms that, honey vending serves as a source of incomes for many households [12] and gives men, women and youth room to make their own income since women are the larger population in the municipal. The study also revealed ten beekeepers in the municipal as at the study period. All these beekeepers in the study area are males. This means that, men are the main beekeepers in the Wa municipal.

Age of consumers.

In terms of age, the survey results shows that majority (about 68%) of the consumers were within the age brackets of 20-39 years. The largest cohort of consumers are however within the age brackets of 30-39 years, representing 35%, followed by those within ages 20-29 years, which constitute about 33%. This result suggest majority of honey 80% consumers, 5% processors and 5% vendors in the Wa Municipality are young people within the age category of 20-39 years in the Wa municipal. The other 10% of processors and vendors are older age categories in the study.

Occupation of consumers.

The results indicate a significant proportion of consumers (41%) are gainfully employed in the waged employment sectors (public & private sectors).

This is followed by those employed in the trade and business sector (25%), farming (13%) and others-students, Artisans, Electrician, Carpenter and apprentices (20%). Again, this result reflects a typical urban environment, which is often dominated by commerce and waged employment. The results thus reflect the urban dynamics of the Wa Township (the capital of the upper west region).

From the economic perspective, this result suggests a nexus between peoples’ purchasing power (ability to afford) and consumption of honey. Therefore, the consumption of honey directly correlates with the purchasing ability of the consumers. In this sense, those in waged employment sector are better placed to consume honey than farmers because they are unable to afford honey and at times will want to consume honey produced by them due to adulteration perception in the markets.

Education level of consumers.

Overall, 77% of the consumers in the study have had some form of education (basic, secondary or tertiary). In specific terms, a greater proportion of consumers (40%) have had tertiary level qualification, and about 38% (combined) have basic and secondary school education. The high level of education among

consumers account for equally high proportion of consumers gainfully employed in the waged labor sectors which was 41%.

However, those without any form of formal education are still significant, representing about 23%. From the results, out of every 10 consumers in the survey, only three (3) are not educated. Although this result looks impressive, the overall educational status in Ghana and the Upper West Region in particular is not encouraging. In the 2010 population and housing census report, 6 in every 10 people (60%) in the upper west region do not have any form of education [11]. This figure is twice higher than the national average illiteracy of about 26%. Although this result does not reflect national statistics, the results portray a unique characteristic of honey consumers in the Wa municipality, which indicate majority of consumers of honey, are educated and gainfully employed in wage labor employment. This proves that the educated and working class seem to understand the nutritional and health benefits of honey hence the high consumption by this class of people.

Brands of honey sold on the Wa market.

The results also show there are two main brands of honey in the study area - thus the local and external brands. The results also show that local brand of honey constitutes the majority (82%) while external brands constitute only 9% when consumers were asked to identify the source of honey they consume. Another 9% of consumers do not know the brand of honey they consumed. These include; local and external brands. Local brand refers to honey produced and processed within the upper west region. On the contrary, honey produced or processed elsewhere either than the upper west region are classified as external brands. This classification is important for the researcher to be able to identify the various sources of honey and to be able to identify the class of honey consumed in the study area.

Source of honey (access point) to consumers in Wa Municipality.

In terms of access points, the results shows that more than half proportion of honey is purchased directly from open market vendors 83.5%. Therefore, this results shows that majority of honey in the Wa municipality is sold in the 'informal' market, where consumers purchase honey directly from vendors. Therefore, honey is often sold in the open market like other goods in Wa Municipality. The result also implies that a section of the educated class equally purchase honey from the open market either as a result of convenience or availability hence the 83.5%. Again, 10.5% of honey is purchased directly from producers. This means that a significant proportion of honey is purchased from the farm gate (source of production), and this could have implications for quality and pricing of honey. Only 6% of honey in the municipality is purchased from provisions and pharmaceutical shops.

There is the belief that consumption of honey gives retentive memory or high intelligent quotient (IQ) for excellent academic performance. Most of the consumers buy honey with the perception that it's of good quality and not adulterated as well as very accessible to consumers. Some consumers buy honey as a result of hygienic practices, quantity and cost less from processors and distributors.

Quantity of honey purchased and type of packaging preference by consumers.

In term of quantities purchased, most consumers were unable to specify the exact quantities they purchased. However, results indicate that honey is often purchased in three main types of containers. These include; plastic bottles (estimated at about 375ml), beer bottles (estimated at about 750 ml) and medium size gallons (estimated at 1875ml). A total of 45.3%, 46.8% and 8% of consumers purchase honey in glass bottles, plastic/rubber bottles and recycled drinking water bottle respectively. Subsequently, consumers were asked with regards to their preference and satisfaction with regards to these storage containers.

Only 22% of consumers expressed their satisfaction with regards to the packaging containers in which honey was sold to them. A half of consumers (50%) were unsatisfied that honey is stored in plastic bottles. Consequently, about 46% of the consumers wished that honey is packaged, labeled and stored in glass bottles for sale.

Features consumers consider when purchasing honey for consumption at home.

Quality is one major focus of this study. Consumers' perception of quality of honey was therefore assessed based on flavor, taste, color and thickness of honey. The results show that majority of consumers have issues with the quality of honey sold in the Wa market and therefore endeavor to look out for a number of quality features, when buying honey. Consequently, about 47% of consumers look out for 'thickness, 25% look out for taste, while only 13% and 14% look out for color and flavor respectively (Figure 2). They believed that these physical characteristics are all-inclusive in determining the quality of honey and stretches an upright conclusion of honey quality.

Consumers in the Municipality ranked thickness, taste, color, and flavor respectively as the most important physical characteristics for obtaining honey for use. Also, some consumers recommended examining moisture adulteration by testing ability of paper or cotton wool dipped in honey and its ability to burn. Again, a match stick dipped in honey to kindle fire as the technique used for guaranteeing quality of honey on the markets. They specified they used this technique frequently because it measures the moisture content of honey, an essential quality index which determines the stability and shelf-life as well as the grade of honey.

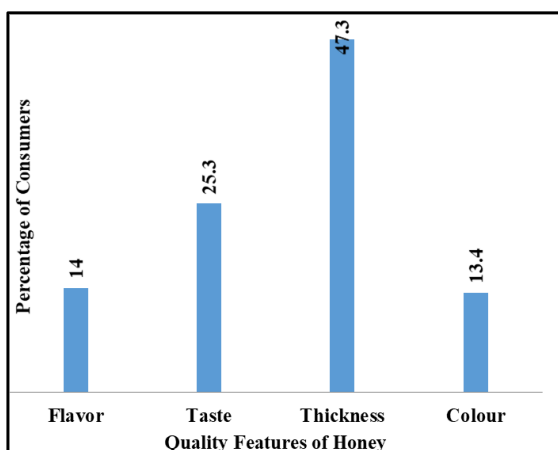


Figure 2: Quality features of honey to consumers on purchase

Influential factors which led Consumers to purchase honey.

With regards to access, honey in Wa is largely purchased from vendors or processors. The results show

that most consumers have their own preferred honey vendors from whom they buy honey. There are several reasons that influence one’s decision to purchase honey from a particular vendor or source. For most consumers, a major factor is the quality, and followed by accessibility of the vendor. As much as 36% of consumers’ reports that they prefer to buy honey from their current source because of its quality. Another 24% ascribed the reason of accessibility of the vendor in their purchasing decision. On the contrary, only 5% of consumers report that they buy honey from any vendor who comes around to their doorstep (Figure 3).

The results suggest a significant majority of honey consumers have their own preferred vendors from which they often buy honey from, and majority have come to stick to a particular vendor because those vendors have quality honey and are easily accessible to customers. Perhaps, this informs the reason why majority of consumers indicated earlier that they often look out for thickness in honey as a sign of quality.

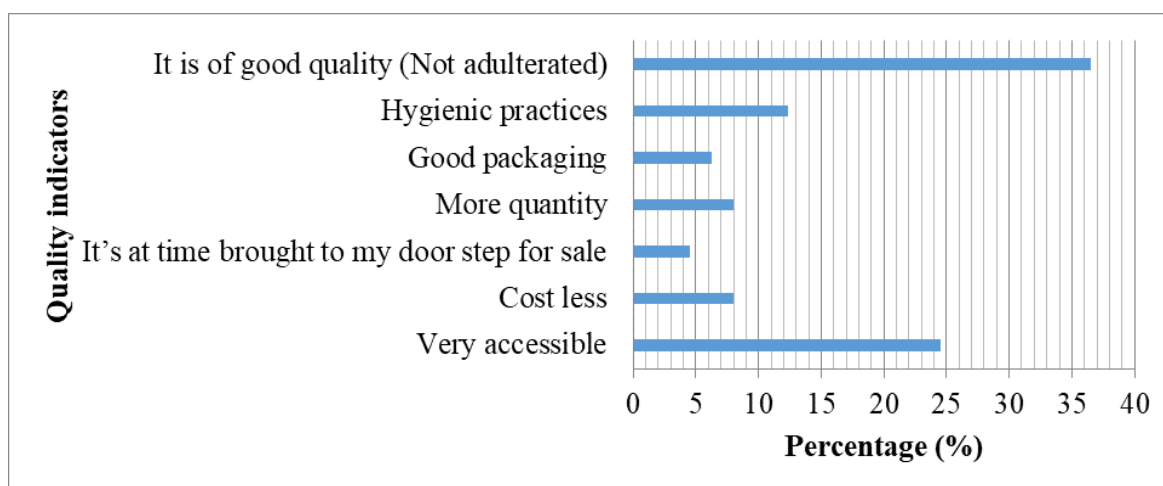


Figure 3: Reasons for consumers purchasing honey

Use and benefits of honey by consumers in Wa Municipality.

Although honey have several uses aside home consumption, majority of consumers (64%) are unaware of this, and only 36% of consumers reports that they also use honey for other purposes aside home consumptions. This means that majority of honey consumers in Wa are unaware of the other uses and importance of honey. The commonest additional uses of honey include; nutrition, medical, cultural and spiritual purposes.

Consumers’ response were sought on health and nutritional benefits of honey. Their responses were given as; Only 7.4% indicated that honey serves as antimicrobial agent, 9% indicated honey serves as anti-inflammatory, 8.4% indicated that honey aids digestion, 9% indicated honey boost the human immune system, 8% indicated honey is rich in micro nutrients, 8%

indicated honey builds human brain, 7.4% indicated honey reduces the risk of getting heart disease, 9% indicated honey controls sugar/insulin related diseases, 8.5% indicated honey cures catarrh and cold, 9.1% indicated honey heals wounds and scars, 8.1% indicated honey is a sleep promoter and finally 8.1% of the survey consumers indicated that honey cures ulcer and other allergies.

Quantity of Honey Consumed in Wa Municipality.

The consumption of honey was measured in five different frames based on multiple response taken from 400 consumers of honey which represented the sample size; daily, weekly, monthly, yearly and rarely ranging from >5ml -21ml measurement.

Overall, the results show that the largest proportion of consumers (24%) consumes honey weekly, followed closely by monthly with 23%, and the least

being rarely (15%). Only 18% consume honey daily. However, there were significant variations with regards to the quantities. The overall average of quantity of honey consumed per person in Wa Municipality was calculated at 1.7 ml. The largest proportion of consumers (62%) consume between 5-10ml of honey per month. This was followed by 53% of consumers consuming between 11-20ml per month, 47% consuming between 5-10 ml per week, 43% in the same category consuming less than 5ml and about 45% of consumers consuming between 11-20ml, and above 21 ml per year. The least proportion of consumers consume about 10% of honey monthly and yearly

Table 5: Quantity of Honey Consumed in Wa municipality.

Duration	Consumption of honey among consumers				
	Less than 5ml (%)	5ml-10ml (%)	11ml-20ml (%)	21ml above (%)	Total (%)
Daily	40.0	25.0	43.3	13.3	18.3
Weekly	43.3	46.7	36.7	31.7	23.7
Monthly	10.0	61.7	53.3	25.0	22.5
Yearly	10.0	36.7	45.0	45.0	20.5
Rarely	23.3	35.0	20.0	21.7	15.0

Major concerns of consumers about honey sold in Wa Municipality.

The major concerns consumers expressed about honey were centered on three main themes, including; quality, pricing, and packaging. Almost all consumers have express at least one concern or more about one or a combination of issue across these three themes. From the findings, about 83% of consumers have concerns about the price of honey, 84% with quality, and 78% have concerned about the packaging of honey. In terms of quality, about 99% of all consumers were concern that there is ineffective government legislation on honey standards to enhance quality of honey. Another 97% of consumers were emphatic about the adulteration of honey (dilution of honey with material such as foam mattress and other substances), and a further 86% were concerned about the environmental conditions under which honey is sold. With regards to storage, a half of consumers (about 50%) were unhappy with the current state of storage of honey. Specifically, 46% were unsatisfied with honey being stored in plastic bottles and recommended glass bottles for storage instead.

IV. CONCLUSION

The daily average of quantity of honey consumed per person in Wa Municipality is 1.7 ml as revealed from the survey thereby creating opportunities for honey trade. The results show that majority of consumers have issues with the quality of honey sold in

the Wa market and therefore endeavor to look out for a number of quality features (thickness, taste, color and flavor) before purchase. They believed that these physical characteristics are all-inclusive in determining the quality of honey and stretches an upright conclusion of honey quality.

Additions of water, sugar and melted mattresses as well as grave honey are the adulteration perceptions raised by consumers. Also, many vendors recommended examining moisture and other features adulteration by testing ability of paper or cotton wool dipped in honey and its ability to burn. They specified they used this technique frequently because it measures the moisture content of honey, an essential quality index which determines the stability and shelf-life as well as the grade of honey. The study also reveals that honey consumption is high in towns than in the villages. This according to the study may be as a result of economic status of consumers and perceived adulteration and honey coming from human graves site. The study equally revealed that consumption of honey is as a result of health grounds, belief systems as well as its medicinal and nutritional benefits.

REFERENCES

[1] M. Shahbandeh (2020). Global production volume of natural honey in 2000-2018.

[2] Sahle H, Enbiyale G, Negash A, et al. Assessment of honey production system, constraints and opportunities in Ethiopia. *Pharm Pharmacol Int J.* 2018; 6(1):42-47. DOI: 10.15406/ppij.2018.06.00153

[3] Codex Alimentarius Commission (2001). ‘‘Procedural manual’’ 12th ed. Rome, Italy, Food and Agriculture Organization of the United Nations, Joint FAO/WHO Food Standards Programme.

[4] Serem, J. C. and Bester, M. J. (2012). ‘‘Physicochemical properties, antioxidant activity and cellular protective effects of honeys from Southern Africa’’, *Food Chemistry.* 133: 1544 – 1550.

[5] Ajibola, A., Chamunorwa, J. P. and Erlwanger, K. H. (2012). ‘‘Nutraceutical values of natural honey and its contribution to human health and wealth’’, *Journal Nutrition & Metabolism. Lipopophilia, London.* 9(61): 1 – 12.

[6] Alvarez-Suarez, J. M., Tulipani, S., Romandini, S., Bertoli, E., & Battino, M. (2010). ‘‘Contribution of honey in nutrition and human health: a review. Mediterranean’’, *Journal of Nutrition and Metabolism,* 3, 15–23

[7] Ahmed, M., Djebli, N., Aissat, S., Khiati, B., Meslem, A., & Bacha, S. (2013). ‘‘In vitro activity of natural honey alone and in combination with curcuma starch against *Rhodotorula mucilaginosa* in correlation with bioactive compounds and diastase activity’’, *Asian Pacific Journal of Tropical Biomedicine,* 3, 816–821.

[8] Akangaamkum, A. D., Agbenorhevi, M. and Okudzeto, C. (2010). *The Honey Industry in Ghana: An*

Overview Synthesis Report SNV (Netherlands Development organization). Accra, Ghana. Pp. 6 – 52.

[9] Fasasi, K. A. (2012). ‘‘Physicochemical Attributes of Nigerian Natural Honey form Honeybees (*Apis mellifera adansonii*) (Hymenoptera: Apidae) and its Shelf Life in Storage at Room Temperature’’, *Pakistan Journal of Biological Sciences*. 15(21): 1027 – 1033.

[10] Bogdanov, S. (2014). ‘‘Honey as Nutrient and Functional Food’’, A Review. *Bee Product Science*. Pp. 1 – 43. [Www.bee-hexagon.net](http://www.bee-hexagon.net). Retrieved on June 24, 2016 at 2:00 AM.

[11] Ghana Statistical Service. (2010). ‘‘Population and Housing Census. District Report. Accra, Ghana. Ghana Statistical Service’’

[12] Getachew, A., Gizaw, H., Assefa, D. and Tajebe, Z. (2014). ‘‘Physico-chemical properties of honey produced in Masha, Gesha, and Sheko Districts in Southwestern Ethiopia’’, *Current Research in Agricultural Sciences*. 1(4): 110 – 116.

[13] Ghana living standard survey. (2014). ‘‘District Report. Accra. Ghana Statistical Service