

# Increase in popularity of flavoured tea: The case of Kenyan tea industries

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## ABSTRACT

The aim of the study was to explore the increase in popularity of flavoured tea brands as well as to investigate their marketing effects vis-à-vis non-flavoured brands. Tea is one of the most popular beverages consumed in Kenya. Over time, companies have started adding flavours to plain tea to enhance taste and create diversity of taste for the consumer. Additives may be in forms of flowers, fruits, herbs and other natural flavours added to tea to produce flavours such as jasmine tea, *masala* tea, lemon grass tea, and green tea. The research was done by analysing literature and administering questionnaires. Findings indicate that with increased diversity of flavours, consumers responded by changing their purchasing patterns and incorporating flavoured tea in their consumption. This in turn has increased the popularity of flavoured tea brands in the market. From these observations, it is clear that the market for flavoured tea brands is more likely to grow due to consumer satisfaction and continual creation and diversification of flavoured.

**Key words:** Additives, Beverages, Flavoured tea, Popularity.

## INTRODUCTION

The Tea Industry is one of the greatest success stories in Kenyan agriculture (Williamson and Clifford, 2011). Tea production and planted area has expanded rapidly since Kenya's independence; from 18,000 metric tonnes and 21,448 hectares in 1963, to 293,670 metric tonnes and 131,418 ha in 2003. Tea exports have been consistent for several decades (Tea Board of Kenya, 2013).

Kenya reported a fairly stable feature of tea export earnings, leading all the other commodities except in 2003 where tea was overtaken by horticulture ranking second and earning Ksh 33 billion (TBK, 2013). This was about 20% of country's total export earnings (Karori *et al.*, 2007). The remarkable growth in the Tea Industry is attributed to the conducive investment policy for the estates sub-sector particularly the non-interference policy from the Tea Board on production, processing and marketing activities as well as the Kenya Tea Development Agency's management of smallholder tea production ([www.ktdaTea.com](http://www.ktdaTea.com)).

Kenya prides itself as the producer of the best quality black tea in the world. About 97% of Kenya's tea is black CTC (cut, tear and curl), which is more popular (Karori *et al.*, 2007). To date, only a little of black orthodox tea and some limited amount of green tea is produced on order. The quality of black tea is highly dependent on the regularity of harvesting, the number of top young leaves harvested and the mode of harvesting/plucking, and the care with which the green leaves are picked.

About 60% of the total tea crop in the country is produced by smallholder growers who process and market their crop through their own management agency, the Kenya Tea Development Agency Limited. The balance of 40% is produced by large-scale estates which are managed

by major multinational firms associated with tea in the world (TBK, 2013). In 2007, the International Tea Committee ranked Kenya the third largest producer of black tea after China, and India (ITC, 2009). At the same time, Kenya was ranked the largest exporter of black tea (FAO, 2001).

### **History of tea drinking**

Tea is the second most popular non-alcoholic beverage in the world after water and it is enjoyed by the rich and poor alike (Werkhoven, 1974). Tea drinking originated from China in the 6<sup>th</sup> century B.C. Over a period of time, it was picked up by neighbouring countries in South East Asia, such as Japan. Western nations started importing tea from China in the 17<sup>th</sup> century (Werkhoven, 1974).

The British developed India as a sourcing base in the 19<sup>th</sup> century to reduce their dependence on China. During the late 19<sup>th</sup> century and early 20<sup>th</sup> century, tea cultivation became popular in other colonies such as Sri Lanka, Tanzania, Malawi and Kenya (Williamson and Clifford, 2011).

### **Flavoured tea**

A flavoured tea is any tea that has flavour added to it. This flavour can be in form of herbs, spices, fruits, flowers or other natural flavours. Additives include cardamom, cloves, ginger, cinnamon, apple, jasmine, hibiscus, citrus peel, lemon, lemongrass and chamomile. The introduction of flavoured varieties of tea has created a robust consumer purchase behaviour that warrants a look at its popularity as opposed to the traditional, plain, non-flavoured tea. To flavour tea, Melvins, a Kenyan company, uses freshly ground spices, which are fully dried then ground to their specifications and they pride themselves in not using any artificial colours or preservatives ([www.melvinstea.com](http://www.melvinstea.com)). The tea is then mixed in their mixing unit with different timings for the different flavours. They are then packaged immediately to conserve maximum flavour and freshness and the packaging is done into an attractive 300 grams carton.

On a global scale, Boughton and Ian (2005) noted that the demand for flavoured tea is more than non-flavoured tea and earning good amount of profit. It is assumed that about 20 billion cups of flavoured drinks (both coffee and tea) are sold every year. In the UK, flavoured tea sales have fallen by 84 million pounds in the last five years. Taste is also changing all around the world; for example, British customers drank more flavoured tea (47.4%) than cappuccino (47.1%) (Capone and Lisa, 2009).

Freeman and Laurie (2011) found out that day-by-day the iced tea and iced coffee demands are increasing and beverage departments also keeping their space for these cold coffee and tea. Kariuki (2009) also mentioned in his qualitative study that the popularity of flavoured tea is increasing in Kenya. Fairmont Hotel website (2004) notes that, “premium tea business is soon to become the new lunch.” Profit may be a partial motive for the extension of traditional afternoon tea hours, as the tea meal service affords hoteliers the opportunity to use dining facilities beyond the traditional hours for breakfast, lunch and dinner.

Green flavoured tea is rich in possibilities as a functional food and is a popular beverage among the new health-conscious generation. Research has started to remove the veil concealing some of its true power as a functional food as attention is being paid to the role of green flavoured tea in bio-regulating functions (McKay and Blumberg, 2002; Erba *et al.*, 2005; Williamson and Manach, 2005; Cabrera *et al.*, 2006); bio-defence function by preventing cancer (Arts, 2008; Ashihara *et al.*, 2008; Wang *et al.*, 2008); disease preventing function by preventing high blood pressure or diabetes; disease-recovery function by inhibiting the rise of cholesterol inflammatory activity (Ashihara *et al.* 2008); physical rhythm-controlling function by stimulating the central nervous system with caffeine and aging-suppressing function by providing the body with antioxidants

(Kotani *et al.*, 2007; Raza and John, 2007). This indicates about the potential popularity of flavoured tea; that apart from offering the health benefits that even the non-flavoured tea offers, it consequently comes with a good taste and aroma that is pleasant.

However, the big question is: Why the popularity of flavoured tea as opposed to the non-flavoured ones? First, when one is not caught up in the hustle and bustle of the daily activities, it is better to brew a cup of loose leaf Kenyan tea which gives a wonderful cup of reddish coppery tint and a pleasant brisk flavour that distinguishes it from other varieties of tea in the world (Wachira, 2002). But due to the high pressures of demands on your day, flavouring companies pride in providing their customers with a convenient offer of tea bags which are packed in attractive envelopes and allow one to have a cup of tea ready within minutes.

Secondly, flavouring innovation was as a result of the knowledge that customers were jaded by conventional tea and loved a hot cup of tea, with lots of fresh ginger boiled together and sweetened to taste (Wachira, 2002). It took time to get proprietors to give the new beverage a chance despite it being different. Persistence, however, outweighed the owner's resistance and customers began seeking out the product and in no time the new product was enthusiastically received by the market and grew steadily ever since.

The flavoured products range at Melvin's is mainly composed of Tangawizi (Ginger) Tea, Vanilla Tea, Masala Tea, Cinnamon Tea and Lemon Twist. Herbal Tea include Green Tea, Nettle Tea, Neem Tea and Chamomile Tea. KETEPA, the largest tea producer in Kenya, has not also been left behind with their Safari Ice Tea which is sweetened, flavoured and ready to drink in the four flavours of Orange, Apple, Blackcurrant and Lemon.

### **Challenges facing the Tea Industry in Kenya**

Over-reliance on black CTC tea with limited product diversification has led to fluctuation in black tea prices. Kenya has over the years relied on production and export of high quality bulk CTC tea, which have been traditionally used as raw material to blend low quality tea from other countries at the expense of Kenyan tea brands (TBK, 2013). The Tea Industry has also not produced tea for other markets like flavoured tea, green tea, and most recently coloured tea. Another area of product diversification includes processing of tea extracts for pharmacological use, processing of convenience fast moving consumer goods such as ready to drink beverages, juice blends and wines.

Over-dependence on traditional tea markets namely Pakistan, UK, Egypt, Sudan and Afghanistan has led to limited market diversification which must be addressed (ITC, 2009). Trade statistics show that out of the top ten export market destinations for Kenyan products, six are in Africa, namely Uganda, Somalia, Egypt, Rwanda, DRC, and Sudan, which are potential markets for Kenyan tea (TBK, 2013).

Brokerage firms also contribute to the loss of income by the growers. In Kenya there are 11 tea brokerage firms. If these brokerage firms were to be scrapped and a single autonomous agent owned by the farmers created, the growers would be able to earn their worth.

### **THE PROBLEM**

The Tea Industry in Kenya, just like in the rest of the world, has gone through profound changes. In the past decade, technological advancement, ever changing customer tastes and preferences, and globalization have slowly but steadily transformed the industry. Although Tea Industry has witnessed rapid innovations, the popularity of flavoured tea as opposed to the plain non-flavoured kind remains significantly uninvestigated. Further, how the flavoured tea has fared in the market as opposed to the non-flavoured kind needs investigation as it has become

increasingly important to find out bearing in mind that the Tea Industry is important both for the economy and the consumers.

### Research objectives

The main objective of this study was to establish the level of the increase in popularity of flavoured tea.

Specifically, the study sought to find out: the flavoured tea brands most preferred by consumers and their influence on purchasing patterns; the effect of flavoured tea brands on market share as compared to the plain, non-flavoured brands; and the challenges faced by flavoured tea brands in their bid to increase the brand popularity.

### Hypotheses

H<sub>01</sub>: There is no significant increase in popularity of flavoured tea.

H<sub>02</sub>: The flavoured tea brands most preferred by consumers do not have a significant influence on purchasing patterns.

H<sub>03</sub>: Flavoured tea brands do not have a significant effect on market share as compared to the plain non-flavoured brands.

## METHODOLOGY

The study adopted descriptive survey research design. It targeted the staff in the departments of Sales and Marketing, Administration; PR, Procurement and Finance of Melvin's and KETEPA who offer both flavoured tea, particularly for Melvin's, and non-flavoured, particularly for KETEPA. They were targeted as they had the required data relevant for the study. The staff targeted was 120. Purposive sampling was used in selecting the two companies for the study. Forty staff members of the two companies were purposively selected to form the sample. Questionnaires administered by the researcher were used in collecting data. Based on the data evaluation instruments, quantitative and qualitative data analytical techniques were utilized; descriptive analysis was employed in data analysis. Descriptive analysis was used to describe the results in the form of means and standard deviation and percentages. Inferential analysis in the form of Pearson Correlations analysis and regression was used too. The SPSS version 20 computer package was used in the analysis of data. Data from questionnaires was presented in tables and graphs.

## RESULTS

### The level of the increase in popularity of flavoured tea

The popularity of flavoured tea brands was increasingly popular and was highly significant ( $M = 3.1324$ ;  $SD = .71123$ ) (Table 1). This was followed by the fact that they were gaining popularity more than the plain non-flavoured brands (and at a significance of  $M = 4.6572$ ;  $SD = 1.0012$ ) (Table 1).

**Table 1: Popularity of flavoured tea brands.**

Popularity	N	%	Mean	Standard Deviation
Flavoured tea brands are increasingly popular	40	83.7	3.1324	.71123
Flavoured tea brands are gaining popularity more than the plain, non-flavoured brands	40	79.7	4.6572	1.0012

## The flavoured tea brands most preferred by consumers based on purchase patterns

**Table 2: The flavoured tea brands most preferred by consumers based on purchase patterns.**

Flavours	N	%	Mean	Standard Deviation
Tangawizi (Ginger)	40	73.7	4.3667	.76913
Vanilla Tea	40	48.7	4.3838	1.90970
Masala Tea	40	60.1	3.6929	1.58256
Cinnamon Tea	40	54.9	4.0457	1.19082
Lemon Twist	40	69.6	4.3190	.81637
Herbal Tea: Green, Nettle, Neem and Chamomile Tea	40	54.7	3.7571	1.05824
Safari Ice tea: flavours of Orange, Apple, Black Currant and Lemon	40	51.2	3.8000	.92072

It is clear that Tangawizi (Ginger) flavour was much preferred ( $M = 4.3667$ ;  $SD = .76913$ ) by consumers based on how much the tea companies sold, with the brand indicating their purchase patterns (Table 2). Followed closely was Lemon Twist ( $M = 4.3190$ ;  $SD = .81637$ ). Vanilla Tea (with  $M = 4.3838$ ;  $SD = 1.90970$ ) had the least preference among the flavours. Based on the percentage results, it can be argued that the flavoured tea were gaining popularity. This eventually lends credence to the assertion that flavoured tea popularity is increasing.

### Effect of flavoured tea brands on market share compared to non-flavoured

Result shows that flavoured tea brands are in a wider market area than non-flavoured ones particularly when you consider that tea is sold across the country. Its presence in a wider market area was also significant ( $M = 4.3007$ ;  $SD = .87613$ ). This indicates that flavoured tea brands were accessible in a wider market but whose sales could not necessarily be ascertained (Table 3).

**Table 3: Effect of flavoured tea brands on market share compared to non-flavoured.**

Statements	N	%	Mean	Standard Deviation
Flavoured tea brands are in a wider market area than non-flavoured tea	40	63.7	4.3007	.87613
Flavoured tea brands are increasingly selling in more shops than non-flavoured tea	40	47.7	4.3488	1.9870
Generally, the flavoured tea brands are gaining a bigger market share as compared to non-flavoured tea	40	64.1	3.7229	1.88266

To ascertain sales, the respondents were asked whether flavoured tea brands were increasingly selling in more shops than non-flavoured. This had a minority result at 47.7% and with least significance ( $M = 4.3488$ ;  $SD = 1.9870$ ). This implies that while the flavoured tea brands were increasingly gaining the market, they still were struggling to sell more. The Melvin's Brand Manager attributed this to the rural population who use the non-flavoured tea more due to the traditional connotation of its use and price.

But finally, when asked whether, generally, the flavoured tea brands were gaining a bigger market share as compared to non-flavoured, 64.1% agreed and was significant ( $M = 3.7229$ ;  $SD = 1.88266$ ). This implies that flavoured tea brands were gaining a bigger market share and as with increasing awareness comes increased popularity.

### Challenges to increased popularity of flavoured tea

There is much evidence that there were challenges facing the popularity of flavoured tea brands (Table 4). The highest being high competition from non-flavoured brands ( $M = 4.2666$ ;  $SD = .71912$ ) followed by lack of adequate information on health benefits of tea ( $M = 4.2191$ ;  $SD = .78637$ ). The least was bad tea policies ( $M = 4.2837$ ;  $SD = 1.80971$ ). Moreover, bad tea policies, lack of consumer awareness via marketing and advertising, and lack of proper tea selling and marketing strategies were major challenges.

**Table 4: Challenges to increased popularity of flavoured tea.**

Challenges	N	%	Mean	Standard Deviation
High competition	40	89.7	4.2666	.71912
Government bureaucracy	40	82.7	4.2837	1.80971
Bad tea policies	40	80.1	3.5928	1.48255
Lack of consumer awareness	40	84.9	4.1456	1.09081
Lack of adequate information on health benefits of tea	40	89.6	4.2191	.78637
Lack of proper tea selling and marketing strategies	40	84.7	3.6570	1.15823

### Correlation analysis

All the independent variables had a positive correlation with the dependent variable with preferred brand having the highest correlation of  $r = 0.655$ ;  $P < 0.01$  followed by market share with a correlation of  $r = 0.635$ ;  $P < 0.01$  and then challenges with a correlation of  $r = 0.578$ ;  $P < 0.01$ . This indicates that all the variables are statistically significant at the 99% confidence interval level 2-tailed (Table 5).

**Table 5: Pearson Correlations.**

		Popularity	Preferred Brand	Market Share	Challenges
Popularity	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	40			
Preferred Brand	Pearson Correlation	.655**	1		
	Sig. (2-tailed)	.000			
	N	40	40		
Market Share	Pearson Correlation	.635**	.433**	1	
	Sig. (2-tailed)	.000	.000		
	N	40	40	40	
Challenges	Pearson Correlation	.578	.410**	.127**	1
	Sig. (2-tailed)	.000	.000	.002	
	N	40	40	40	40

### Regression analysis for hypotheses testing

As observed in Table 6, the coefficient of determination  $R^2$  value was 0.841. This shows that 84.1% of the variance in dependent variable (popularity) was explained and predicted by independent variables (preferred brand, market share, challenges).

**Table 6: Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882 <sup>a</sup>	.848	.841	.196
a. Predictors: (Constant), preferred brand, market share, challenges				
b. Dependent Variable: popularity				

The *F*-statistics produced ( $F = 114.491$ .) was significant at 5% level (Sig.  $F < 0.05$ ), thus confirming the fitness of the model and therefore, there is statistically significant relationship between popularity, and preferred brand, market share and challenges (Table 7).

**Table 7: ANOVA<sup>b</sup>**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	242.743	3	47.046	114.491	.000 <sup>a</sup>
	Residual	12.888	237	.684		
	Total	255.631	240			
a. Predictors: (Constant), preferred brand, market share, challenges						
b. Dependent Variable: popularity						

**Table 8: Coefficients.**

The *t*-value of constant produced ( $t = 7.668$ ) was significant at .000% level (Sig.  $F < 0.05$ ), thus confirming the fitness of the model (Table 8). Based on the Beta and Sig figures, all the variables had a significant predictive effect on the dependent variable and were thus statistically significant.

Model B		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Std. Error	Beta			
1	(Constant)	2.767	.361	.287	7.668	.000
	Preferred brand	.385	.078	.393	5.968	.000
	Market share	.168	.065	.193	2.593	.004
	Challenges	.329	.064	.352	5.129	.000
a. Dependent Variable: Organizational performance						

From: Regression Model

$$y_{od} = \alpha + \beta_1 (PB) + \beta_2 (MS) + \beta_3 (C) + e$$

Thus;

$$y_{od} = 2.767 + 0.393 (PB) + 0.193 (MS) + 0.352 (C)$$

Thus, the three hypotheses;  $H_{01}$ : there is no significant increase in popularity of flavoured tea;  $H_{02}$ : the flavoured tea brands most preferred by consumers do not have a significant influence on purchasing patterns;  $H_{03}$ : flavoured tea brands do not have a significant effect on market share as compared to the plain non-flavoured brands, are all rejected.

## DISCUSSION

The results agree with the reviewed literature; that the demand for flavoured tea is increasingly becoming more than non-flavoured tea and earning good amount of profit (Boughton and Ian, 2005). Further, according to Freeman and Laurie (2011), day by day the iced tea and iced coffee

demand are increasing and beverage departments also keeping their space for these cold coffee and tea. Kariuki (2009), also mentioned in his qualitative study that the popularity of flavoured tea is increasing in Kenya. All these speak of both flavoured tea popularity as a preferred brand and its widening market share.

Research has started to speak of its health benefits. That is, the role of green flavoured tea in bio-regulating functions (McKay and Blumberg, 2002; Erba *et al.*, 2005; Williamson and Manach, 2005; Cabrera *et al.*, 2006); bio-defence function by preventing cancer (Arts, 2008; Ashihara *et al.*, 2008; Wang *et al.*, 2008), disease preventing function by preventing high blood pressure or diabetes, disease-recovery function by inhibiting the rise of cholesterol inflammatory activity (Ashihara *et al.*, 2008), physical rhythm-controlling function by stimulating the central nervous system with caffeine and aging-suppressing function by providing the body with antioxidants (Kotani *et al.*, 2007; Raza and John, 2007). This demonstrates the potential popularity of flavoured tea; that apart from offering the health benefits that even the non-flavoured tea offers, it consequently comes with a good taste and aroma that is pleasant.

## CONCLUSION AND RECOMMENDATIONS

Based on the results, it can be concluded that, firstly, flavoured tea brands are increasingly popular in the Kenyan market. Secondly, that *tangawizi* (ginger) and lemon twist flavoured brands are the most preferred. Thirdly, that flavoured tea brands are increasingly gaining a wider market as compared to the non-flavoured counterpart. And fourthly, that high competition from non-flavoured brands followed by lack of adequate information on health benefits of tea were the main challenges facing the popularity of flavoured tea brands.

The study, therefore, recommends that the Tea Industry should create a robust marketing strategy, which should be both formulated and implemented to create consumer awareness of the flavoured tea brands. The strategy should include the health benefits of the brands which will increase popularity, market share and purchasing power. The Tea Industry should ensure that the flavoured tea brands are accessible in all areas even in rural areas and that the brands should be strategically priced and packaged to suit the entire spectrum of the socio-economic and demographic characteristics of consumers.

The Government through the line ministry should ensure that the policies formulated on the sale of tea formulated to mitigate against challenges facing the popularity and purchase of flavoured tea brands.

## REFERENCES

- Arts I.C. (2008). A Review of the epidemiological evidence on tea, flavonoids, and lung cancer. *The Journal of Nutrition*. 138: 1561S-1566S.
- Ashihara H.; Sano H. and Crozier A. (2008). Caffeine and related purine alkaloids: Biosynthesis, catabolism, function and genetic engineering. *Photochemistry*. 69: 841-856.
- Boughton B.H. and Ian B. (2005). Changing taste of coffee consumption. *Caterer & Hotelkeeper*. 195: 43-82.
- Cabrera C.; Artacho R. and Giménez R. (2006). Beneficial effects of green tea – A review. *Journal of the American College of Nutrition*. 25: 79-99.
- Capone B. and Lisa G. (2009). Growing coffee with multiple benefits. *In Business*. 21(3).
- Erba D.; Sano H. and Crozier A. (2005). Effectiveness of moderate green tea consumption on anti-oxidative status and plasma lipid profile in humans. *The Journal of Nutritional Biochemistry*. 16: 144-149.



- Fairmont Hotels (2004). *Premium Tea Business is Soon to Become the New Lunch*. Available at: www.fairmont.com.
- Food and Agriculture Organization (2001). *Food and Agriculture Organization World Production Statistics*. Rome: FAO.
- Freeman G. and Laurie G. (2011). Iced tea, coffee drinks get warmer reception. *Drug Store News*. Vol. 19, Issue 19.
- ITC (2009). *International Tea Committee – Annual Bulletin of Statistics*. London: International Tea Committee.
- Karori S.; Wachira F.N., Wanyoko, J.K. and Ngure R. (2007). Antioxidant capacity of different types of tea products. *African Journal of Biotechnology*. 6 (19): 287-2296.
- Kotani A., Takahashi K., Hakamata H., Kojima S. and Kusu F. (2007). Attomole catechins determination by capillary liquid chromatography with electrochemical detection. *Analytical Sciences*. 23: 157-163.
- Lawless H. and Heymann H. (2008). *Sensory Evaluation of Food: Principles and Practices*. Chapman & Hall. New York. 848.
- Manzocco L.; Anse M. and Nicoli M. (1998). Antioxidant properties of tea extracts as affected by processing. *Lebensmittel-Wissenschaft und-Technologie*. 31: 694-698.
- McKay D.L. and Blumberg J.B. (2002). The role of tea in human health: An Update. *Journal of the American College of Nutrition*. 21: 1-13.
- Raza H. and John A. (2007). *In vitro* protection of reactive oxygen species-induced degradation of lipids, proteins and 2-Deoxyribose by tea catechins. *Food and Chemical Toxicology*. 45: 1814-1820.
- Tea Board of Kenya Statistics (2013). *Tea Board of Kenya Statistics*. Nairobi: Tea Board of Kenya.
- Tea Research Foundation of Kenya (2002). Anonymous, *The Tea Growers Hand Book*. 5th Edn. Nairobi: The Tea Research Foundation of Kenya Printing Services.
- Tea Research Foundation of Kenya (2010). *Tea Research Foundation of Kenya Strategic Plan 2010-2015*. Kericho: Tea Research Foundation of Kenya.
- Wachira F.N. (2002). Crop Improvement. In: *The Tea growers Handbook*. TRFK 5<sup>th</sup> Edition. The Tea Research Foundation of Kenya.
- Wang R.; Zhou W. and Jiang X. (2008). Reaction kinetics of degradation and epimerization of epigallocatechin gallate (EGCG) in aqueous system over a wide temperature range. *Journal of Agriculture and Food Chemistry*. 56: 2694-2701.
- Werkhoven, J. (1974). Introduction. In FAO, *Tea Processing*. Rome: Food and Agriculture Organization of the United Nations. pp 1.
- Williamson G. and Manach C. (2005). Bioavailability and Bio-Efficacy of Polyphenes in Humans. II. Review of 93 Intervention Studies. *The American Journal of Clinical Nutrition*. 81: 243S-255S.
- Williamson K. and Clifford M. (2011). *Tea-Cultivation to Consumption*. London: Chapman and Hall.