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Original Research Paper

Role of Tea Industry in India with respect to International Market

Commerce

KEYWORDS : Production strategies, Tea global markets, Exporters, Domestic Market.

Kaarthika. K. V

M Com. student, Amrita Schoolm of Arts and Sciences,Edappaly,Cochin.co, Kerala, cochin 682024. India

ABSTRACT

In India the tea trading is done in two ways in domestic market by way of auction and private selling. Market reports from six major auction centeres in India namely Calcutta, Silgiri, Cochin, Coonoor, Coimbatore where Bulk trading is done through auction held in these centeres.

India is one of the largest Tea producer with the finest quality in the world with India accounting for 27% of the world tea production. India's is an important tea exporter accounting for around 12-13% of world tea exporters. Further certain varieties of are grow only in India and are in great demand across the world. India's tea industry export were estimated at Rs 17.31 billion during 2006, accounting for 0.4% of India's exports.

Introduction

The History of Tea Drinking In India

The documented evidence according to the history of tea drinking in India dates back to 750 BC. Tea in India is generally grown in the North Eastern regions and the Nilgiri Hills. Having evolved since those early days, tea drinking in India has now come a long way. Today this nation is proud to be one of the largest tea producers in the world. Buddhist monks in India have used tea for its medicinal value since thousands of years. According to a very interesting legend, the history of tea drinking in India began with a saintly Buddhist monk about almost 2000 years ago. It so happened that this monk who later became the founder of Zen Buddhism, decided to spend seven sleepless years contemplating the life and teachings of Buddha. While he was in the fifth year of his contemplation and prayer, he almost fell asleep. He took some leaves from a nearby bush and began chewing them. These leaves revived him and enabled him to stay awake as he chewed on them whenever he felt drowsy. Thus he was able to complete his penance for seven years. These were the leaves of the wild tea plant.

Tea drinking has evolved in different ways over the years in India and differs from region to region. First thought of as the drink of the Royals, tea has now become the favorite of the common man as India leads the world in tea drinking. From the humble roadside tea stalls and the railway platforms to the boardrooms of corporate India, tea is easily available. The cup of sweet and refreshing chai available in teashops or train stations to the masala teas of North India, the variety of brews available is numerous. According to the records, Assam tea is named after the region from where the tea comes and has revolutionized the tea drinking habits of the Indians. Most Indians drink tea with milk and sugar. Traditionally, a guest in any Indian home is welcomed with a cup of tea.

Statement of the problem

The study deals with Indian tea industry and its role in the international market and its production strategies.

Objectives of the study

- To find out the present production strategies of tea industry.
- It also deals with the role in the international market.
- To find out the countries to which tea is exported from India
- To find out the profit they get from the tea industry.

Methodology

Interview method is use for conducting the study.

Major Tea Producing States in India

TEA AREA as on 31-12-2013 & PRODUCTION IN 2013-14

State / Districts	Area under Tea (in Th. Hectares)	Production (Million Kg)
Assam Valley	270.92	581.03
Cachar	33,48	48.02
Total Assam	304.40	629.05
Darieeling	17.82	8.91
Dooars	72.92	117.85
Terai	49.70	125.34
Total West Bengal	140.44	312.10
Other North Indian States (Includes Tripura, Uttarakhand, Bihar, Manipur; Sikkim, Arunachal Pradesh, Himachal Pradesh, Nagaland, Meghalaya, Mizoram and Orissa)	12.29	23.92
Total North India	457.13	965.07
Tamil Nadu	69.62	174.71
Kerala	35.01	63.48
Karnataka	2.22	5.52
Total South India	106.85	243.71
ALL TOTAL	563.98	1208.78

(Source Data from Tea board)

Indian Tea in the international perspective

Global Tea Scenario

More than 30 countries spread over al! the continents except North America with wide range of agro-climatic conditions between 42'N (Georgia) and 35'S latitude (Argentina) grow tea. The estimated global production in2012 was 4625 million kg. With the world consumption around 4440 million kg, the global production and absorption remained finely balanced.

Major tea producing and exporting countries are China, India, Kenya and Sri Lanka and they account for 78% and 71% of world production and exports respectively. (Table-1)

Table 1 Production and Export share of major producing and exporting countries

Country	2012			
	Production		Export	
	Million Kg	%share	Million Kg	%share
China	1789,75	39	321.79	18
India	1126.33	24	208.26	12
Kenya	369.56	8	430.21	24
Sri Lanka	328.4	7	306.04	17
Others	1010,59	22	510.21	29
World Total	4624.63	100	1776.51	100

(Source Data from Tea board)

TEA BOARD 14, B.T.M. Sarani, Kolkata- 700 001

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Major Country wise Exports of tea from India during 2015 (Jan to December)

Country Name	2015 (Jan-Dec)*					2014 (Jan-Dec)				
	Qty (M.Kgs)	Value (Cr.f)	Value (Mill US$)	Unit Price (Rs/Kg)	Unit Price ($/Kg)	Qty (M.Kgs)	Value (CrRs.)	Value (Mill US$)	Unit Price (Rs/Kg)	Unit Price ($/Kg)
Russian Fed	45.70	628.36	97.99	137.50	2.14	38.96	599.52	98.23	153.88	2.52
Ukraine	3.11	44.04	6.87	141.61	2.21	2.43	36.46	5.97	150.04	2.46
Kazakhstan	10.14	261.94	40.85	258.32	4.03	12.06	236.65	38.78	196.23	3.22
Other CIS	0.83	15.01	2.34	180.84	2.82	0.84	18.04	2.96	214.76	3.52
Total CIS	59.78	949.35	148.05	158.81	2.48	54.29	890.67	145.94	164.06	2.69
UK	17.72	356.25	55.55	201.04	3.14	18.16	346.39	56.75	190.74	3.13
Netherlands	2.85	71.08	11.08	249.40	3.89	2.97	92.86	15.22	312.66	5.12
Germany	9.05	233.11	36.35	257.58	4.02	7.18	224.60	36.80	312.81	5.13
Ireland	1.66	64.38	10.04	387.83	6.05	1.97	78.11	12.80	396.50	6.50
Poland	5.29	73.95	11.53	139.79	2.18	4.17	64.18	10.52	153.91	2.52
U.S.A	13.55	347.30	54.16	256.31	4.00	13.05	346.78	56.82	265.73	4.35
Canada	2.04	57.35	8.94	281.13	4.38	1.38	35.99	5.90	260.80	4.27
UA.E	15.11	302.79	47.22	200.39	3.12	17.34	341.04	55.88	196.68	3.22
Iran	20.33	519.22	80.97	255.40	3.98	18.68	496.36	81.33	265.72	4.35
Saudi Arabia	2.70	61.43	9.58	227.52	3.55	3.24	75.32	12.34	232.47	3.81
Egypt (ARE)	2.89	26.63	4.15	92.15	1.44	8.19	90.88	14.89	110.96	1.82
Afghanistan	1.70	17.12	2.67	100.71	1.57	2.25	22.26	3.65	98.93	1.62
Bangladesh	9.39	74.91	11.68	79.78	1.24	5.89	50.02	8.20	84.92	1.39
China	3.93	76.43	11.92	194.48	3.03	3.59	71.52	11.72	199.22	3.26
Singapore	0.44	11.24	1.75	255.45	3.98	0.38	10.95	1.79	288.16	4.72
Sri Lanka	2.23	33.53	5.23	150.36	2.34	2.74	34.88	5.71	127.30	2.09
Kenya	2.54	25.69	4.01	101.14	1.58	2.41	23.12	3.79	95.93	1.57
Japan	3.00	126.95	19.80	423.17	6.60	3.53	155.93	25.55	441.73	7.24
Pakistan	19.05	175.40	27.35	92.07	1.44	15.80	144.22	23.63	91.28	1.50
Australia	3.15	106.67	16.63	338.63	5.28	3.32	112.72	18.47	339.52	5.56
Other Countries	19.27	375.15	58.50	194.68	3.04	16.91	345.22	56.56	204.15	3.35
Total	217.67	4085.93	637.16	187.71	2.93	207.44	4054.02	664.26	195.43	3.20

(P) Provisional, subject to revision.
(Source Data from Tea board)
TEA BOARD 14, B.T.M. Sarani, Kolkata- 700 001.

State wise and Month wise Production data for the year 2015 (E) - Qty. in M.Kgs

State/Month	Jan	Feb	March	April	May	June	July	August	Sep	Oct	Nov	Dec	Jan to Dec
Assam Valley	0.77	0.21	11.42	32.16	55.34	57.49	84.68	84.27	85.06	85.69	51.84	19.94	568.87
Cachar	0.41	0.06	0.45	2.37	4.26	5.22	6.22	6.56	5.93	6.89	4.89	2.44	45.70
Assam	1.18	0.27	11.87	34.53	59.60	62.71	90.90	90.83	90.99	92.58	56.73	22.38	614.57
Dooars	1.10	1.13	7.79	9.01	18.27	18.94	23.99	24.66	22.92	26.32	17.99	9.58	181.70
Terai	1.76	0.84	6.43	6.38	13.63	15.33	18.21	17.50	15.29	16.50	12.84	8.25	132.96
Darjeeling	0.00	0.00	0.23	1.22	0.95	0.85	1.44	1.48	1.03	0.95	0.46	0.11	8.72
West Bengal	2.86	1.97	14.45	16.61	32.85	35.12	43.64	43.64	39.24	43.77	31.29	17.94	323.38
Others	0.14	0.01	0.75	2.03	2.78	3.10	3.53	3.42	3.28	3.24	2.36	1.04	25.68
North India	4.18	2.25	27.07	53.17	95.23	100.93	138.07	137.89	133.51	139.59	90.38	41.36	963.63
Tamil Nadu	11.37	9.51	11.38	17.77	18.14	17.32	14.07	12.21	13.60	14.83	12.31	10.43	162.94
Kerala	5.34	4.07	4.80	6.52	7.27	6.70	4.10	4.63	4.35	3.05	3.49	3.69	58.01
Karnataka	0.45	0.37	0.51	0.60	0.69	0.76	0.40	0.42	0.56	0.59	0.70	0.47	6.52
South India	17.16	13.95	16.69	24.89	26.10	24.78	18.57	17.26	18.51	18.47	16.50	14.59	227.47
All India	21.34	16.20	43.76	78.06	121.33	125.71	156.64	155.15	152.02	158.06	106.88	55.95	1191.10

(E) Estimated, subject to revision. (Source: Tea Board India)
(Source Data from Tea board)

Exports
Total global exports in 2012 increased by 1 % - 1 7.51 million Kgs over 2011 (Table-5). Kenya, China, Sri Lanka and India retained their leading position in the order of 1st, 2nd, 3rd, 4th in the total global exports.

Table 5
Percentage Exports to total production of major producing countries

Country	2011	2012
Kenya export in M.kg	421.27	430.21
% of production	111.00	116.00
China export in M.kg	322.58	321.79
% of production	20.00	18.00
Sri Lanka export in M.kg	301.27	306.04
% of production	92.00	93.00
India export in M.kg	215.42	208.26
% of production	19.00	18.00
Others export in M.kg	493.46	510.21
% of production	49.00	50.00
Total world Exports	1759.00	1776.51
% of Global production	39.00	38.00

(Source: ITC Annual Bulletin of Statistics 2013)

The quality of tea leaf for processing depends principally on the nature and the chemical composition of the plucked leaf, which in turn, depends on the type of bush, the growing conditions and the plucking standard.

Table 1 Chemical composition of tea leaf

Constituent	% Dry leaf	% Water soluble
Polyphenols	22.0	20-35
Caffeine	4.0	3.0-4.0
Amino Acids	7.0	6.5-7.0
Sugars	3.0	3.0
Minerals	5.0	4.0
Pectins	6.5	2.3
Crude Fibre	24.0	0.0
Proteins	17.0	0.0
Fats	8.0	0.0
Organic Acids	3.0	3.0
Starch	0.5	0.0
Total	100.0	45.3

(Source Data from Tea board)

Polyphenols are responsible for colour, briskness, brightness, body and strength. Caffeine, besides being a stimulant, contribute towards briskness while the amino acids and sugars contribute towards development of aroma.

Plucking Standard
Plucking standard refers to the fineness or coarseness of the harvested shoot. The following five plucking standards are recognised in N.E. India. (Table 2)

Table 2 various plucking standards

Plucking standard	Type of shoot plucked
Fine	1 + Bud, 2 + Bud, single soft banjhis
Standard or Normal	Large 1 + Bud, 2 + Bud and single banjhis
Medium	2 + Bud, single & double banjhis
Coarse	2 + Bud, shoots larger than 2 + Bud & double banjhis
Very Coarse	3 + Bud & double banjhis

(Source Data from Tea board)

The quality of tea produced from plucked shoots decreases from bud downwards due to the decrease in major chemical components and also due to the gradual increase in the Crude Fibre contents. (Tables 3 & 4)

Table 3 Major chemical components in a tea shoot (% Dry wt.)

Shoot component	Polyphenols	Caffeine
Bud	26.5	4.7
1st Leaf	25.9	4.2
2nd Leaf	20.7	3.5
3rd Leaf	17.1	2.9
Upper Stem	11.5	2.5
Lower Stem	5.3	1.3

(Source Data from Tea board)

Table 4 Variation in chemical components

Shoot	Water Soluble Solids (%)	TF (%)	TR (%)	Caffeine (%)	Crude Fibre (%)
1 +B	48.0	1.3	12.8	5.3	8.0
2 + B	46.0	1.7	14.5	4.2	10.0
3 + B	42.0	1.4	15.0	3.8	12.0
4 + B	36.0	1.1	15.0	3.2	18.0

(Source Data from Tea board)

The significance in relation to the relative values of teas made from 2 + B and 3 + B is : from the above table and it tells why a good standard of plucking is essential for manufacture: of good quality tea.

BLACK TEA MANUFACTURING
- Growing of Plants
- Plucking
- Carrying to the factory
- PROCESSING
- Withering
- Grind leaf
- Fermentation
- Drier
- Sorting or Grading
- Dispatching

WITHERING
Chemical wither starts immediately after plucking. It is independent of the rate of loss of moisture and is a function of time and temperature. Although the desired moisture level may be reached in a few hours, the catabolic changes, which had been initiated at the time of plucking, will take time. The chemical composition of the leaf will thus be unsuitable for manufacture after the leaf has been desiccated for a few hours, feetis, therefore, necessary to continue to supply sufficient air and wait for breakdown of large organic molecules to simpler structures. The following chemical changes occur during withering:

- Release of carbon dioxide and water due to break down of larger molecules.
- Changes in enzyme activity.

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- Partial break down of proteins to amino acids which act as precursors for aroma.
- Increase in caffeine content - this contributes towards briskness.
- Production of Volatile Flavour Components (VFC): Some of these compounds contribute to the grassy odour and others are responsible for the flowery aroma.
- Reduction in chlorophyll content.

Physical withering reduces the moisture content in the leaf and correct withering is essential for quality, although, it has always been a difficult task to determine the end-point of withers.

CTC PROCESSING

This is the most important machine in a factory producing CTC type of tea. For CTC processing preconditioning of the withered leaf is done either by a Rolling table or a Rotorvane. In a Rotorvane, withered leaf fed through a hopper is continuously pressed by the feed worm and brought to the processing zone where the leaf worked upon mechanically by the rotor elements viz. vanes or battens over the cone against the cylinder inside surface and the elements there in. The pressure is regularised by opening the Iris plate or by moving the pressure sleeve.

The pressure applied in the Rotorvane should be sufficient to express just enough juice for spreading over the cut leaf.

FERMENTATION

Fermentation is essentially an oxidation process during which the liquor characteristics viz.briskness, brightness, colour, quantity and strength are oxidised and polymerised into theaflavins (TF) and Thearubigins (TR) in presence of enzymes..

The fermentation time depends upon:

- severity of treatment
- jat/clone of tea,
- temperature,
- standard of leaf,
- atmospheric condition,
- moisture content of leaf and
- market requirements.

DRYING:

On an average 100 kg of fresh leaf produces 22.5 kg of dried tea containing residual 3% moisture. The difference of 77.5 kg between the figures rep during the process. Of the 77.5 kg, about 2C-around 20-50 kg are evaporated during drying. A leaf particle change from around 70% to 3% during drying.

During drying the moisture content of the fermented leaf is brought down from around 60 - 65% (orthodox) and 68-70% (CTC) to 3%. The enzyme activity ceases during drying. But the process does not stop abruptly on dropping the leaf into the dryer. There is possibility of enhancing the fermentation rate at the initial stage of drying due to rise of temperature before high temperature brings stop to the enzyme activity. During the early stage of drying the solid is so wet that a continuous layer of moisture exists over the entire surface. The temperature of the solid particles will be near the wet bulb temperature of the drying air. Removal of this layer of film of moisture is easier, such evaporation rate is independent of the moisture content of the particle, and the moisture will be evaporated at the constant rate. This stage of drying is known as the 'constant rate drying'.

With the freely available water from the surface of the solid particle evaporated the drying no more takes place at the constant rate. Under this condition diffusion process controls the drying rates. The moisture trapped inside the drying particle travels to the surface before being evaporated. With reduction of moisture the drying now takes place at a falling rate. The quantity of moisture removed during the "Falling rate period" is small but the time taken is quite long. Hence the falling rate period has a very important effect on the time of drying and is dependent on size of the particle, thickness of spread and external variables like volumetric flow, temperature and humidity of air.

Other important changes taking place during drying:

- Caramalisation of sugar - contributes to aroma
- Production of the varnishing appearance by the action of enzyme pectase -. contributes to appearance
- Degradation of chlorophyll - contributes to appearance

The black colour of the tea is imparted by the dry film of leaf juice of oxidised, unoxidised and condensed catechinsspread over the leaf particles. Unsatisfactory withering, under processing, firing at too high a temperature and excessive handling reduce blackness. Teas made from coarse leaf and leaves that have undergone intensive maceration are browner.

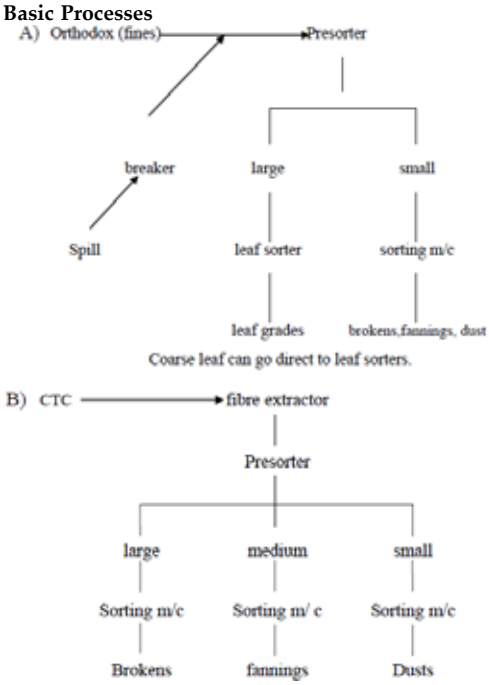
SORTING

Definition of Sorting

Sorting is the operation in which particles of bulk tea are separated into various grades different sizes conforming to the trade requirements.

- Equipment types
- Manual - Hand sieves and stalk picking
- Sizing over screens
- Gravity separation
- Fibre extraction
- Combination
- Fibre extractor mounted on sizing sorted - Hobro, Vibro screen
- Breakers -

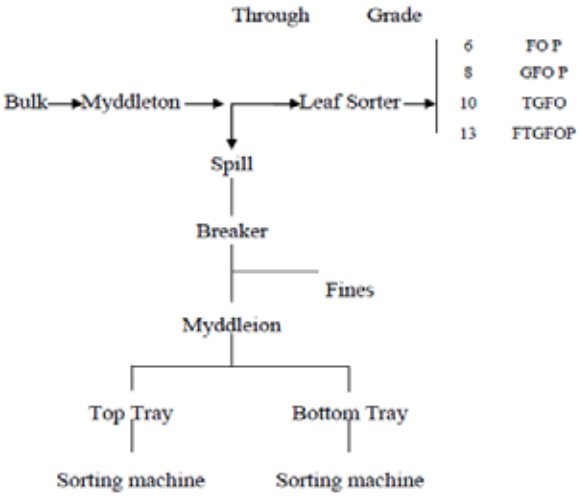
Basic Processes



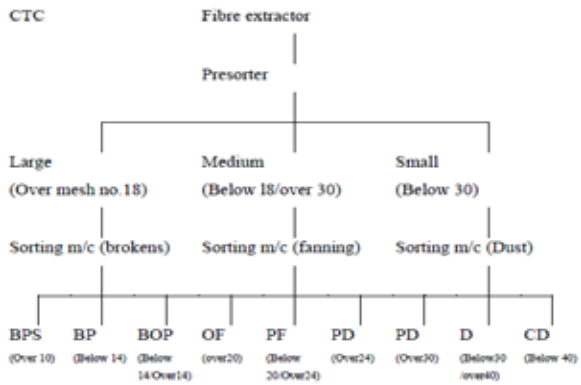
C) Residues are milled.
Spills are broken and resorted

Typical example of commonly practiced sorting systems

Orthodox



Trough	Over	Grade	Through	Over	Grade
10	12	BOP	23	24	FOF/GOF
12	14	BP	24	28	PF
14	16	FBOP	28	30	GFD
16	18	GBOP	30	40	OD
18		GFBOP	40		OCD



Data analysis

Major Country wise Exports of tea from India during 2015 (Jan to December)

Country Name	2015 (Jan-Dec)*					2014 (Jan-Dec)				
	Qty (M.Kgs)	Value (Cr.f)	Value (Mill US$)	Unit Price (Rs/Kg)	Unit Price ($/Kg)	Qty (M.Kgs)	Value (CrRs.)	Value (Mill US$)	Unit Price (Rs/Kg)	Unit Price ($/Kg)
Russian Fed	45.70	628.36	97.99	137.50	2.14	38.96	599.52	98.23	153.88	2.52
Ukraine	3.11	44.04	6.87	141.61	2.21	2.43	36.46	5.97	150.04	2.46
Kazakhstan	10.14	261.94	40.85	258.32	4.03	12.06	236.65	38.78	196.23	3.22
Other CIS	0.83	15.01	2.34	180.84	2.82	0.84	18.04	2.96	214.76	3.52
Total CIS	59.78	949.35	148.05	158.81	2.48	54.29	890.67	145.94	164.06	2.69
UK	17.72	356.25	55.55	201.04	3.14	18.16	346.39	56.75	190.74	3.13
Netherlands	2.85	71.08	11.08	249.40	3.89	2.97	92.86	15.22	312.66	5.12
Germany	9.05	233.11	36.35	257.58	4.02	7.18	224.60	36.80	312.81	5.13
Ireland	1.66	64.38	10.04	387.83	6.05	1.97	78.11	12.80	396.50	6.50
Poland	5.29	73.95	11.53	139.79	2.18	4.17	64.18	10.52	153.91	2.52
U.S.A	13.55	347.30	54.16	256.31	4.00	13.05	346.78	56.82	265.73	4.35
Canada	2.04	57.35	8.94	281.13	4.38	1.38	35.99	5.90	260.80	4.27
UA.E	15.11	302.79	47.22	200.39	3.12	17.34	341.04	55.88	196.68	3.22
Iran	20.33	519.22	80.97	255.40	3.98	18.68	496.36	81.33	265.72	4.35
Saudi Arabia	2.70	61.43	9.58	227.52	3.55	3.24	75.32	12.34	232.47	3.81
Egypt (ARE)	2.89	26.63	4.15	92.15	1.44	8.19	90.88	14.89	110.96	1.82
Afghanistan	1.70	17.12	2.67	100.71	1.57	2.25	22.26	3.65	98.93	1.62
Bangladesh	9.39	74.91	11.68	79.78	1.24	5.89	50.02	8.20	84.92	1.39
China	3.93	76.43	11.92	194.48	3.03	3.59	71.52	11.72	199.22	3.26
Singapore	0.44	11.24	1.75	255.45	3.98	0.38	10.95	1.79	288.16	4.72
Sri Lanka	2.23	33.53	5.23	150.36	2.34	2.74	34.88	5.71	127.30	2.09
Kenya	2.54	25.69	4.01	101.14	1.58	2.41	23.12	3.79	95.93	1.57
Japan	3.00	126.95	19.80	423.17	6.60	3.53	155.93	25.55	441.73	7.24
Pakistan	19.05	175.40	27.35	92.07	1.44	15.80	144.22	23.63	91.28	1.50
Australia	3.15	106.67	16.63	338.63	5.28	3.32	112.72	18.47	339.52	5.56
Other Countries	19.27	375.15	58.50	194.68	3.04	16.91	345.22	56.56	204.15	3.35
Total	217.67	4085.93.	637.16	187.71	2.93	207.44	4054.02	664.26	195.43	3.20

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Findings

According to Tea industry in India there are different type of tea, they are green tea, black tea, white tea herbal tea oolong tea.

1. According to tea industry in India there are different type of tea they are green tea, black tea, white tea, Herbal tea Oolong tea
2. Black tea is the major tea producing preferred in India
3. Tea drinking has evolved in different ways of the years in India and differ from from region to region
4. In india major tea producing states are(Area under hectres)Assam so totaProductionl value is 304.40.in millionkgs are under 629.05
5. After assam value ,west Bengal is the major tea producing state in india
6. Total South India the major tea producing states are are Tamil Nadu,Kerala, Karnataka
7. Tea involves various healthy elements such as
- POLYEPHENOLS
- Caffeine
- Amino acids, sugar , minerals
- Pectins
- Crude Fibre
8. Black tea manufacturing include
- Growing of plants
- Plucking
- Carrrying to the factory
9. Procesing include
- Withering
- Grind leaf
- Fermentation
- Drier
- Sorting or grading
- Despatching
10. In case of black tea manufacturing include two procedures that is manufacturing and processing
11. In processing include Withering, grinding leaf, fermentation, Drier, Sorting or grading dispatching etc.
12. Chemical wither starts immediately after plucking. It is independent of the rate of loss of moisture and it is a function of time and temperature.
13. CTC Processing This is the most important machine in a factory producing state are ctc type of tea.
14. FERMENTATION is essentially an oxidation process during which the liquor charecteristics such as briskn essbrightness,colourquantityand strength are oxidized And converted into theoflavins important changing. theaovibaginstheaflavinstheumbegins Sorting is the operation in which particles of black tea are separated into various grinding difference size conforming trade requierments.
15. The Major Tea producing state and exporting countries Are china,India and Keniya

Suggestions

- It include the varieties of tea and exporting that to other countries.
- Another suggestion is that the consumers of tea must know about various tea and not only the black tea.
- The production strategies of tea must be expanded.

Conclusion

Tea industry in India has grown tea in two widely separate regions namely the Northern India and South India. In Srilanka tea estate are spread according to the elevation the tea regions of high mid and low elevations. There have also been significant. Structures changes that occurred fragmentation and emergence of small in terms of land. The settlement programmer in south India showed an in small tea growers in recent years. Increase

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