

Quality Standards &

Maintenance of Artisanal Tea '

By

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Aturugiriya.

2/. 'Maintenance of the Quality of Artisanal Tea'



Maintaining of the safety & quality of artisanal tea & applicable Standards/ Guidelines

General Quality concerns

- Good Agricultural Practices
- Plucking standards
- Leaf transporting conditions
- Hygienic condition of the Home/ place of manual operation/ Factory
- Capacity & work force of the work floor
- Workers hygienic conditions daily behavior
- Storing conditions & storing capacity
- Environment conditions of the work place
- Keeping quality of the manufactured tea CCPs
- Packing quality of the tea
- Good house keeping practices
- Conditions on transportation, Security on goods
- Buyer's/ Consumers' requirements
- Certification requirements
- Regulatory requirements



Plucking



Pruning



Good Agricultural Practices



Pest & Disease control



Fertilizing



- * Plucking standards
- * Leaf transporting conditions





- * Hygienic condition of the Home/ place of manual operation/ Factory
- * Capacity & work force of the work floor
- * Workers hygienic conditions daily behavior



What is Quality ?

Quality aspects in tea manufacture – key elements;

In field – Growers' attitudes, Plant materials, Agro-chemicals, Application techniques, Machinery, Good agricultural practices (GAP), Harvesting practices, Environmental factors, Contaminants, Conditions of sites, Packing practices, Regulatory requirements

In transportation – Habits of leaf collectors, Distance and delivery time, Conditions of leaf carriers, Environmental factors, Road traffics, Regulatory requirements

In factory – Health conditions of workers, workers' involvements or practices in manufacture, Leaf quality, Good manufacturing practices (GMP), Conditions of machineries, Maintenance practices, Control of documents, Monitoring and critical controlling of hazards, Cleaning practices, Good hygienic practices (GHP), Control of fire risks, Environment controls, Regulatory requirements

Manufactured tea – Storing conditions, Factory capacity, Controlled environment conditions, Keeping quality, Packing quality, Good house keeping, Buyer's/ Consumers requirements, Control of hazards, Conditions on transportation, Security on goods, Regulatory requirements.

International requirements for tea industry

ISO 22000: 2005

– Food safety management systems – Requirements for organization in the food chain

Complying for the tea industry

food safety – concept that food (tea) will not cause harm to the consumer (tea drinker) when it is prepared and/or consume (drink) according to its intended use.

food chain – sequence of the stages and operations involved in the production (tea fields), processing (tea factories), storage (tea warehouses) and handling of a food and its ingredients (tea blending & packaging), from primary production to consumption.

food safety hazards – biological, chemical or physical agents in food, or condition of food with the potential to cause and adverse health effect (tea contaminants and adulterants).

hazards analysis – the organization (Tea Board) determines the strategy to be used to ensure hazard control by combining the PRPs (prerequisite programme), operational PRPs, CCP (Critical Control Points) and the HACCP

Related requirements/ Standards in tea industry

ISO 9001: 2000

- Quality Management Systems – Requirements

SLS 1315: Part 1: 2009

- Good Agricultural Practices for the Cultivation of Tea

SLS 1315: Part 2: 2007

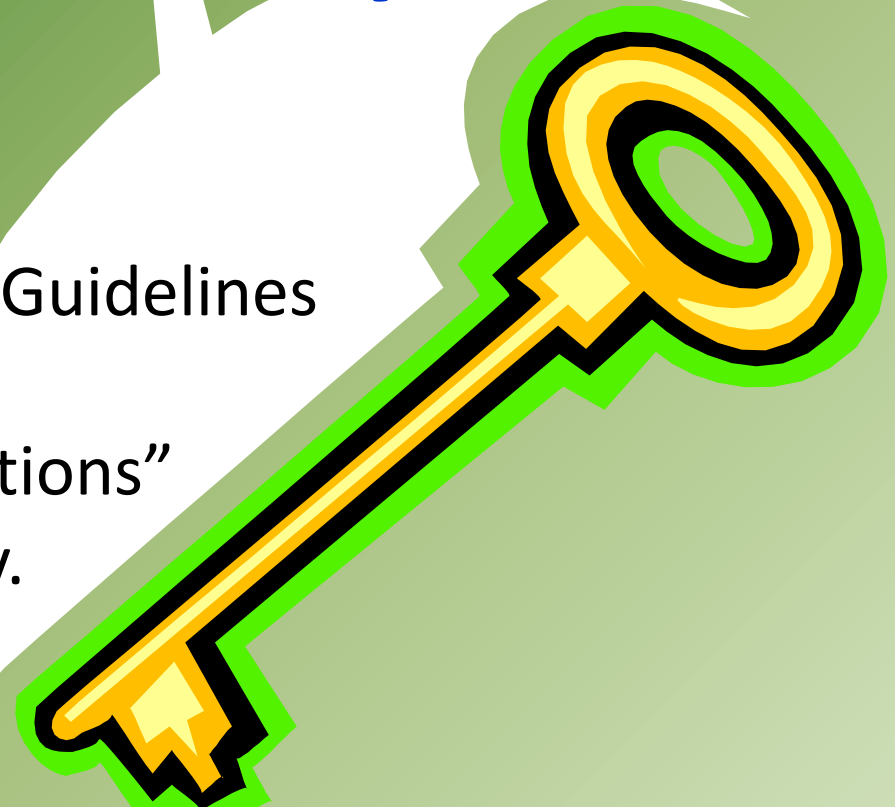
- Good Manufacturing Practices for Processing of Black Tea

SLS 1315: Part 3: 2009

- Good Hygienic Practices for Storage, Blending, Packaging, and Transport of Tea

“Key recommendations” for food safety

The 2005 USDA Dietary Guidelines
give five
“Key Recommendations”
for food safety.



Source: <http://www.health.gov/dietaryguidelines/dga2005/recommendations.htm>

Recommendation 1: CLEAN



Before entering to tea processing area;

Make sure to have;

- Healthy, with no wounds and infectious disease,
- Clean hands/ protective hand with gloves,
- Clean or covered foot/ change slippers,
- Wear clean clothes/ use overcoat, head caps
- Tools/ machinery with no damages, no oil leaks, good order of working.
- Clean floor, contact surfaces with pure/ microbiologically safety water and residues of disinfections.

Do NOT wash or rinse any tool, floor near to process tea as this could spread bacteria to other lineup tea in process

Recommendation 1: CLEAN



Apron/ over coat



Protective gloves



Head covers



Protective masks



Foot covers



Leg covers

Recommendation 1: CLEAN



Wash hands after ...

Using bathroom or
changing diapers



Sneezing, blowing
nose & coughing

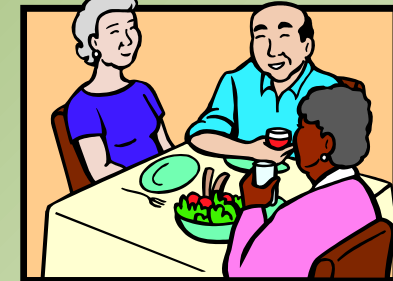


Touching a cut or open sore

AND before ...



Handling food



Recommendation 2: SEPARATE

Keep separate always;
incoming green leaf,
withered leaf,
rolled leaf,
rolled dhools,
fermented leaf,
dried leaf/made tea and sifted/graded tea
and packed tea

While

weighing, transferring, firing, sifting and
packing in any place of processing tea in
tea manufacture.



Recommendation 3:

Controlled environmental conditions

Use correct temperature recommended during the manufacture, specially in tea firing which support to kill microorganisms of early contaminated in steps in tea manufacture.

(Inlet temperature of around 90 -115°C (200 - 240 °F) is used to bring out the desired flavour. Exhaust temperature is equally important. For conventional drier an exhaust temperature of 49-54°C (120-130°F) is advocated as at this range the oxidation of the leaf is brought nearly to a stop).

And
Keep maintain the existing temperature (28 ± 2 °C) and humidity (70 ± 5 % RH) (air moisture concentration) in places ware storing tea and teas opening to the environment to prevent growth of pre-contaminated microbes-spores and to make keeping quality.

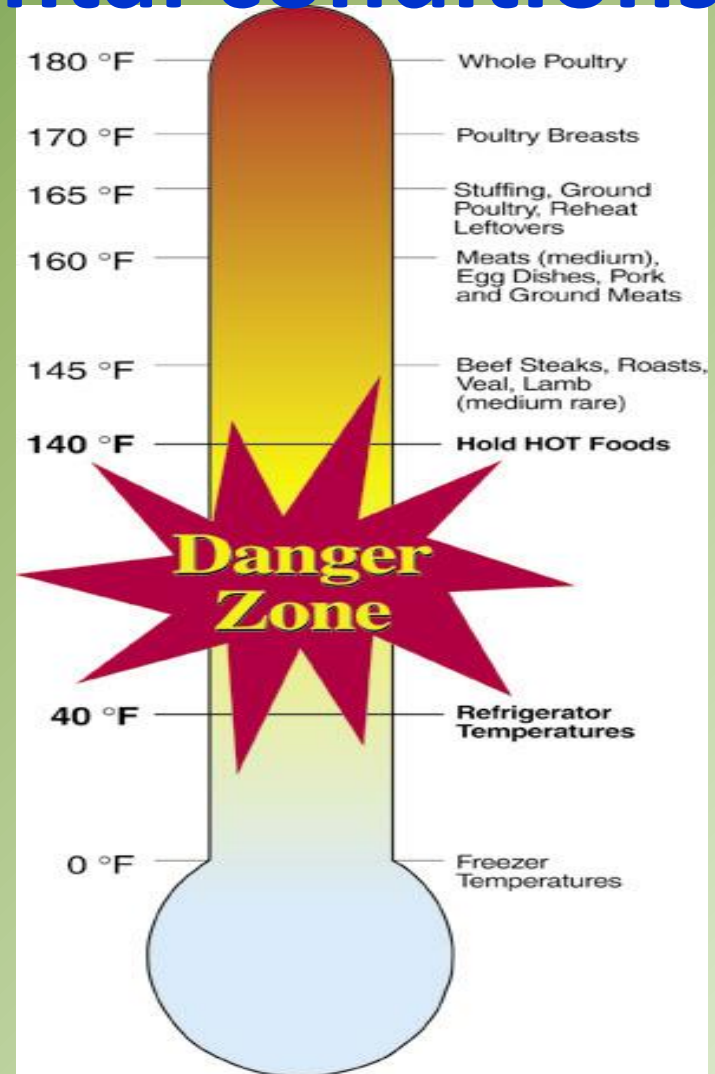


Recommendation 3:

Controlled environmental conditions

**DANGER
ZONE**

Bacteria multiply *rapidly*
between
40 and 140 degrees F.



Possible tea contamination/adulteration during the manufacturing process floor

Contaminants/ Adulteration can be made through:-

- a) Poor GAP, GMP, HACCP, FSMS
- b) Process contaminants:
 - a) Sand, grits, glass etc.,
 - b) Magnetic admixture/ iron particles
 - c) Metal particles: braze and aluminum etc.,
- c) Foreign particles:
 - a) hair, faecal matter, insects, etc.,
- d) Foreign substances:
 - a) grease, oil, coir, nylon thread etc.,
- e) Water born contaminants
- f) Environmental contaminants

Major physical contaminants in tea



iron particles of magnetic admixture



Pieces of wood, scraps, plastics, coir etc.,

Major physical and biological contaminants in tea



Microscopically Examination;

Microscopically appearance

Particle appearance

Tea stokes

Dead insects

Alive insects

Parts of foreign parts / debris

Foreign matter

Mould growths / visible moulds

Stalks, dead insects, alive insects, debris, visible moulds [etc.](#)



Complaints received from major importing countries:

Russia	- Siliceous matter, homogeneity of sample
Japan	- Maximum pesticide residues, MCPA,
Germany	- Metal contaminants, MRLs
Other EU Countries	- Metal contaminants, MRLs
Iran	- High crude fibre/ poor tea
Chili	- Microbiological issue
Dubai	- Microbial contaminants
Azerbaijan	- Extraneous matter
Turkey	- Variation of grade
USA	- Payment uncertainty
UAE	- Unable to sell
Iraq	- Contractual problem
Jordan	- Packaging/ Labeling issue
Taiwan	- Chemical contaminants, Glyphoste

Testing the Quality of Tea

- General requirements for testing to assess the quality of made tea
 - a. Tests for ISO 3720 (black tea) & ISO 11287 (green tea) International Standards
 - b. Tests for traces for Heavy metals/ toxic metals
 - c. Chemical residues analysis
 - d. Grade analysis
 - e. Contaminations/ adulteration determinations
 - f. Pesticide residues analysis
 - g. Microscopically examinations

a. Tests for ISO 3720 International Standards

- ❖ ISO 1573 (1980), Tea –
Determination of loss in mass at 103 °C (Moisture).
- ❖ ISO 1575 (1987), Tea –
Determination of total ash.
- ❖ ISO 1576 (1988), Tea –
Determination of water – soluble ash and water – insoluble ash.
- ❖ ISO 1577 (1987), Tea –
Determination of acid - insoluble ash.
- ❖ ISO 1578 (1975), Tea –
Determination of alkalinity of water - soluble ash.

Tests for ISO 3720 International Standards contd ...

- ❖ ISO 9768 (1998), Tea –
Determination of water extract.

- ❖ ISO 15598 (1999), Tea –
Determination of crude fibre content.

Sri Lanka Tea Board Minimum Quality Standards (MQS) for “Sri Lankan Origin Tea” **SLTB Circular No: AL/MQS-02/2021**

Basic Requirements for ‘Black Tea’: ISO 3720: 2011 Sri Lanka Standards 135:2009 (AMD 421:2011)

Characteristic	Requirement	Test Method Ref.
	Black Tea	
1. Water extract, mass fraction	min. 32 %	ISO 9768:1994; SLS 28 Part 7:2008
2. Total Ash, mass fraction	min. 4% - max. 8%	ISO 1575:1987; SLS 28 Part 3:2008
3. Water - soluble ash, mass fraction of total ash	min. 45%	ISO 1576:1988; SLS 28 Part 4:2008
4. Alkalinity of water-soluble ash (as KOH), mass fraction	min. 1.0% - max. 3.0%	ISO 1578:1975; SLS 28 Part 6:2008
5. Acid insoluble ash, mass fraction	max. 1.0%	ISO 1577:1987; SLS 28 Part 5:2008
6. Crude fibre, mass fraction	max. 16.5%	ISO 15598:1999; SLS 28 Part 8:2008
7. Total polyphenols, mass fraction	min. 9%	ISO 14502-1: 2005; SLS 28 Part 9/ Section 1: 2011

Sri Lanka Tea Board Minimum Quality Standards (MQS) for “Sri Lankan Origin Tea”

Basic Requirements for ‘Green Tea’: ISO 11287: 2011; Sri Lanka Standards 1413:2011

Characteristic	Requirement	Test Method Ref.
	Green Tea	
1. Water extract, mass fraction	min. 32 %	ISO 9768:1994; SLS 28 Part 7:2008
2. Total Ash, mass fraction	min. 4% - max. 8%	ISO 1575:1987; SLS 28 Part 3:2008
3. Water - soluble ash, Mass fraction of total ash	min. 45%	ISO 1576:1988; SLS 28 Part 4:2008
4. Alkalinity of water-soluble ash (As KOH), mass fraction	min. 1.0% - max. 3.0%	ISO 1578:1975; SLS 28 Part 6:2008
5. Acid insoluble ash, mass fraction	max. 1.0%	ISO 1577:1987; SLS 28 Part 5:2008
6. Crude fibre, mass fraction	max. 16.5%	ISO 15598:1999;SLS 28 Part 8:2008
7. Total catechins, mass fraction	min. 7%	ISO 14502-2: 2005; SLS 28 Part 9/ Section 2: 2011
8. Total polyphenols, mass fraction	min. 11%	ISO 14502-1: 2005; SLS 28 Part 9/ Section 1: 2011
9. Ratio total catechins to total polyphenols, mass fraction	min. 0.5	-

Sri Lanka Tea Board Minimum Quality Standards (MQS) for “Sri Lankan Origin Tea” SLTB Circular No: AL/MQS-02/2021

Foreign Matter/ Extraneous Matters – Completely free

- (Teas should comply with ISO 3720:2011 and ISO 11287: 2011 parameters specified above)

Detectable Metals:

<u>Name of Metal</u>	<u>Acceptable Limit</u>	<u>Test Method/s</u>
• Iron (as ferrous)	– max. 300 mg/kg	AAS/ICP-MS/OES
• Copper	– max. 100 mg/kg	AAS/ICP-MS/OES
• Lead	– max. 2 mg/kg	AAS/ICP-MS/OES
• Zinc	- max. 100 mg/kg	AAS/ICP-MS/OES
• Cadmium	– max. 0.2 mg/kg	AAS/ICP-MS/OES
• Sodium	- max. 0.7% (m/m)	AFS/FFM

Sri Lanka Tea Board Minimum Quality Standards (MQS) for “Sri Lankan Origin Tea” **SLTB Circular No: AL/MQS-02/2021**

Microbiological Requirement:

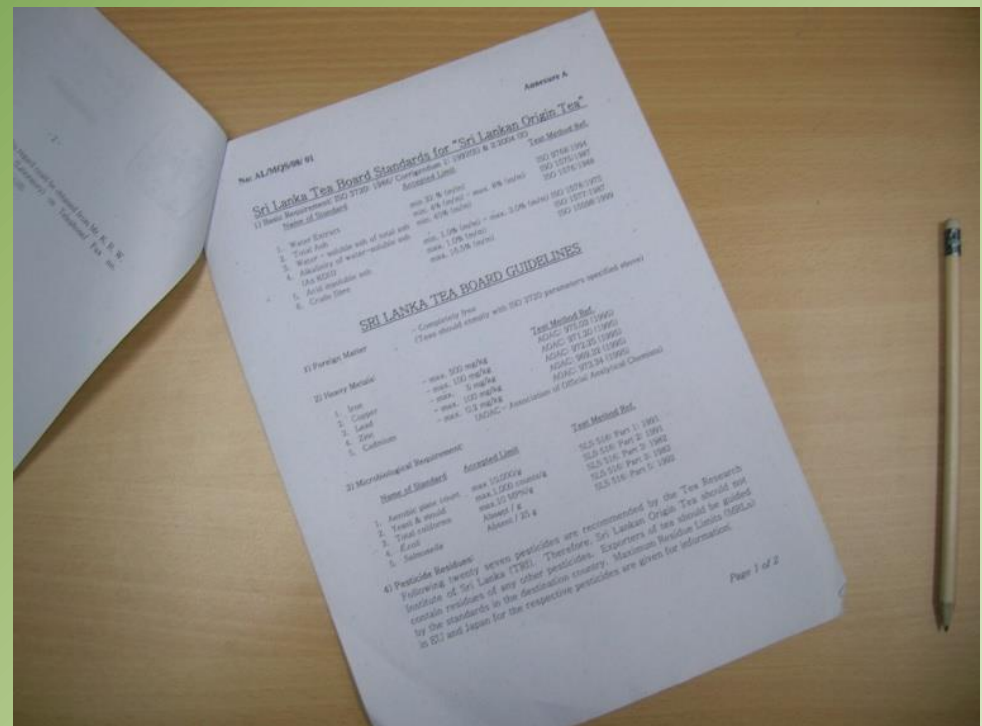
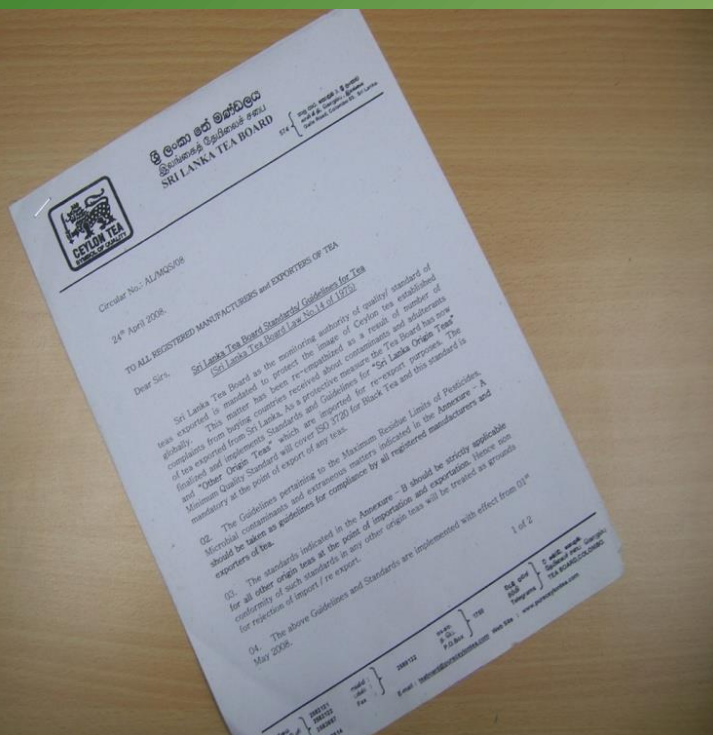
Characteristic	Requirement		Test Method Ref.
	Black Tea	Green Tea	
Total Plate Count	Max. 10,000 cfu/g		ISO 4833-1: 2013; SLS 516 Part 1/ Section 1: 2013
Yeast & Moulds Count	max.1,000 cfu/g		ISO 21527-2: 2008; SLS 516 Part 2/ Section 2: 2013*
Total Coliform Count	max.10 MPN/g		ISO 4831: 2006; SLS 516 Part 3/ Section 1: 2013
E-Coli	Absent / g		ISO 7251: 2005; SLS 516 Part 12: 2013
Salmonella	Absent / 25 g		ISO 6579:2002; SLS 516: Part 5: 1992

*Note:

- 1). Teas under damp/ wet condition (Water activity, $A_w > 95\%$) are required to use test method: ISO 21527-1: 2008: SLS 516: Part 2/ Section 1: 2013.
- 2). In addition to the above, concerned parties should be guided by the standards applicable in the destination country as required by the importer.

Tea Board Standards/ Guidelines for Minimum Quality Standards – 2021

SLTB Circular No: AL/MQS-02/2021 dated 1st January 2021



www.Srilankateaboard.lk
www.pureceylontea.com



Thank You.



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