© IJCIRAS | ISSN (O) - 2581-5334
March 2019 | Vol. 1 Issue. 10

GENERAL FOOD SAFETY ISSUES IN TEA

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Abstract

In recent days, food safety issues have been at forefront of global consciousness. Every year, more people around the world become sick as the reason of unsafe food. Tea is the most consumed nonalcoholic beverage in the world. Maintaining food safety from agricultural practice to consuming is a big task. The food turns unsafe due to the two main reasons namely contamination and pesticide residue. Food contamination refers to food that has been corrupted with another substance which can cause consumer illness. The food is contaminated in three ways namely physical, biological and chemical.

Keyword: Tea

1.INTRODUCTION

As of late, nourishment security issues have been at front line of worldwide cognizance. Consistently, more individuals around the globe end up wiped out as the reason of perilous nourishment. Tea is the most devoured non-alcoholic refreshment on the planet. Keeping up sustenance security from agrarian practice to expending is a major assignment. The nourishment turns hazardous because of the two primary reasons in particular defilement and pesticide build up. Sustenance defilement alludes to nourishment that has been ruined with another substance which can cause customer disease. The sustenance is defiled in three different ways to be specific physical, natural and substance.

2.PHYSICAL CONTAMINATION

Amid the preparing remote material like Iron, plastic, fleece, and so on may go into the tea. This physical defilement is going on because of carelessness in work. Aside from different defilements, iron filings are the serious issue in tea preparing. More iron than indicated may cause cirrhosis, osteoporosis, scurvy, diabetes, heart disappointment, oesophageal malignant growth and diseases. The tea mix is somewhat acidic in nature; thus the iron molecule solubilisation is very conceivable in tea blend. This is the motivation behind why the administration of India gives more weight on limiting the iron fillings in tea.

3.BIOLOGICAL CONTAMINATION

Natural pollution alludes to nourishment sullied by living beings or substances. It might be brought about by the people, rodents, creepy crawlies and microorganisms. Amid the tea preparing and putting away, a few micro organisms will may develop with great ecological condition. ***Salmonella*** pathogens may develop subsequent to handling the tea amid capacity at beneath 25^0C and >35% relative mugginess and it might make due above 55^0C. ***Salmonella*** may prompt to Diarrhea, fever, stomach spasms, retching for human being. Hence amid tea planning water temperature ought to be above85^0 C.

Toxigenic organisms going about as mycotoxin makers, for example, aflatoxins are delivered amid the optional digestion of ***Aspergillus flavus***, ***A. parasiticus*** and ***A. nomius***. ***Aflatoxins***, for the most part ***aflatoxin B1***, are specifically connected with liver malignancy in individuals. Tea defiled with form smelly and may not discharge its intrinsic fragrance when the bundle is opened. Besides implantation of contagious defiled tea will drain out synthetic concoctions from the parasite that may veil or obliterate the unobtrusive favours (taste and fragrance) for which teas are perpetually tanked. Tea dampness diminishing to <2.5% amid capacity may decrease aflatoxins formation. ***Clostridium botulinum*** is a Gram-positive, bar moulded, anaerobic, spore-shaping, motile bacterium with the capacity to deliver a neurotoxin known as ***botulinum***. ***Botulinum*** poison,

additionally called "marvel poison," is a standout amongst the most toxic organic substances known. It is a neurotoxin delivered by the bacterium Clostridium. ***C. botulinum*** is a commit anaerobe that is broadly circulated in nature and is thought to be available on vacuumed tea. Its ideal development temperature is inside the mesophilic run (20^0C to 45^0C). In spore structure, it is the most warmth safe pathogen that can get by in low corrosive sustenance and develop to create poison. The poison assaults the sensory system. This poison is detoxified by holding sustenance at 100 °C for 10 minutes. Be that as it may, in tea it may unrealistic.

4.CHEMICAL CONTAMINATION

Compound tainting alludes to sustenance that has been sullied with a characteristic or fake synthetic substance. These contaminants are especially hazardous as they open individuals to any number of lethal substances, some of which can be deadly.

Organic defilement -A low-level tainting is **polychlorinated biphenyls** (PCBs). This gathering of substances was broadly utilized in transformers and capacitors, as warmth exchange liquids, and as an added substance in colours, carbon paper, printing ink, pesticides, and plastics. PCBs remain a universal, low-level contaminant of numerous nourishments, particularly tea in rolling and drying. **Polycyclic aromatic hydrocarbons** (PAHs) comprise an expansive class of natural exacerbates that are made out of at least two intertwined sweet-smelling rings. They are essentially framed by smoke in tea amid the drying procedure. Anthraquinone is a broadly spread contaminant in tea tests, conceivably moving from the pressing to the tea particularly from printing ink. It is a colour however in some cases found to framing from smoke.

Inorganic defilement- Metals are the most bottomless gathering of concoction components on the worlds outside and can be found in all sustenance. Some of them are fundamental to the eating routine, inside certain particular resiliencies, while others are available as contaminants and represent a hazard to the human well being. For the most part in tea **Lead, Cadmium** and **iron** can be found as the primary metal contaminators. All these metal originates from agricultural practices to pressing procedure. Contingent upon the dimension of sullying, a few remedial activities must be set up including investigations of crude materials, assessment of generation steps and the examination of bundling and additionally conveyance forms.

5.BUILD UP (RESIDUE)

Pesticide **build up** alludes to the pesticides that may stay on or in sustenance after they are connected to nourishment crops. Maximum Residue Levels (MRLs) are the most astounding deposits legitimately permitted to be in/on nourishment things after utilization of pesticides as indicated by mark bearings. MRLs demonstrate legitimate utilization of pesticides. MRLs are resolved to be alright for purchasers, however are not the security level. Build up preliminaries test the "assuming the worst possible scenario" named use headings (most elevated application rate, briefest interim between applications, max number of utilizations, and most brief Pre-Harvest Interval). Nourishment is exchanged far and wide like never before previously, and MRLs are exchanging gauges. Nations are expanding checking of imported sustenance things. The most extreme permissible dimensions of these deposits in sustenance are frequently stipulated by administrative bodies in numerous nations. A general default MRL of 0.01 mg/kg applies where a pesticide isn't explicitly referenced.

The MRLs level may vary nation to nation on account of worthy day by day consumption (ADI). The ADI is a gauge of the measure of a concoction that can be ingested every day over a lifetime without apparent wellbeing hazard. It is gotten from No-Observed-Adverse-Effect-Levels (NOAELs) decided in a battery of lethality tests in creatures and enlarged by human information where accessible. ADI speaks to the measure of build-ups that can securely be devoured every day over a human's lifetime without antagonistic impacts.

In the event that pesticides/herbicides are utilized, their application must be confined to those items under Plant Protection Code (PPC) prescribed by tea explore organizes and endorsed by Tea board. So as to direct the utilization of pesticides in tea, Tea Board of India has as of late authorized a complete rule for safe use of **Plant Protection Formulations** (PPFs) in the tea estates in India called "**Plant Protection Code**" for the Indian tea industry.

The C O D E X A L I M E N T A R I U S universal sustenance measures, rules and codes of training add to the wellbeing, quality and decency of this worldwide nourishment exchange. Shoppers can confide in the wellbeing and nature of the sustenance items they purchase and merchants can believe that the nourishment they requested will be as per their details. Codex Maximum Residue Limits are suggested based on proper build up information acquired primarily from administered preliminaries. The build up information accordingly acquired reflect enrolled or affirmed use of the pesticide as per "great agrarian practices". These may change impressively from district to area inferable from contrasts in nearby nuisance control necessities which are because of an assortment of reasons. Subsequently, build-ups in nourishment, especially at a point near reap may likewise fluctuate. In building up Codex MRLs, these varieties in build-ups because of contrasts in "great farming practices" are mulled over, quite far based on accessible data.

6.ADULTERATION

Nourishment debasement is the procedure in which the nature of sustenance is brought down either by the expansion of sub-par quality material or by extraction of profitable fixing. A sustenance thing is said to be corrupted if: A substance which is included is harmful for human utilization. Defilement of nourishment makes medical issue and utilization of corrupted sustenance isn't fitting/supported from Food Safety perspective. FSSAI on tea makes reference to that "The item will be free from incidental issue, included shading matter and destructive substances". Tea (completed item/made tea) once in a while contains unessential shading material which isn't permitted, called adulterant tea. There are infrequent reports that sub-model tea leaves used to be shaded with Bismarck Brown, Potassium Blue, Turmeric, Indigo, and Plumb ago and so on to confer some favourite shading or shininess to the item.

7.GUARANTEEING FOOD WELLBEING BY RESEARCH FACILITY EXAMINATION

Most known substance contaminants in nourishments are little natural atoms. Aside from abnormal state adulterants, they are commonly present in sustenance at low focuses (parts per trillion to parts for each million); along these lines, their investigations in complex nourishment frameworks are regularly very difficult. The fundamental systematic methodology includes an extraction utilizing an appropriate dissolvable, cleanup to expel meddling network parts, a chromatographic division and a specific recognition.

The usage of mass spectrometry (MS) as an identification system has genuinely changed the examination of compound contaminants in sustenance. Rather than component specific or non particular locators, MS can identify a wide scope of mixes free of their natural organization and give concurrent evaluation and basic distinguishing proof of recognized example. It likewise includes another level of division/selectivity over chromatographic detachments. These interesting highlights have settled on MS the main decision for recognition and recognizable proof/affirmation of follow level natural synthetic contaminants in current testing research facilities.

The mix of MS with gas chromatography (GC-MS) has turned out to be well known for the investigation of unpredictable and semi unstable mixes, including numerous pesticide build-ups, PAHs, PCBs and different less-polar Pesticide Organic Pollutants (POP). Increasingly polar, thermo labile and less unstable examples were hard to break down until the later presentation of barometrical ionization strategies, for example, electrospray, for fluid chromatography-mass spectrometry (LC-MS). LC-MS has opened the way to the immediate examination of lot progressively polar contaminants, including current, new-age pesticides and poisons, for example, mycotoxins. A considerable lot of the rising and as of late distinguished contaminants, including Bismarck Brown or potassium Blue colours, are examined ideally by LC-MS.

The cutting edge sustenance contaminant testing research facilities use both GC-MS and LC-MS to cover the wide extremity scope of conceivable natural substance contaminants. Couple (MS/MS) is ordinarily utilized to give an expanded selectivity (particularly in LC-MS) that promotes recognize target mixes from potential lattice impedance. Atomic Magnetic Resonance (NMR) spectroscopy is the investigation of turn changes at the atomic dimension when radiofrequency vitality is caught up within the sight of attractive field.NMR is the most integral asset accessible for natural structure assurance.

The best strategies to investigation in follow components are nuclear spectroscopic techniques, for example, nuclear retention and nuclear outflow. Techniques regularly utilized in the age of nourishment creation information incorporate fire nuclear assimilation spectrometry (FAAS), graphite heater nuclear retention spectrometry (GFAAS) and inductively coupled plasma nuclear outflow spectrometry (ICP/AES). The UV-VIS spectroscopy is chiefly used to look at the nature of tea, for example, Appearance, shading, flavour and surface are basic viewpoints for the tactile quality.

8.SUSTENANCE SECURITY REGULATIONS

An Act to merge the laws identifying with sustenance and to set up the Food Safety and Standards Authority of India (FSSAI) for setting down science based principles for article of nourishment and to direct their assembling, stockpiling, appropriation, deal and import, to guarantee accessibility of protected and healthy nourishment for human utilization and formatters associated there with or coincidental thereto. Pressing material names will not to contain false or deceiving articulations. The name ought to announce Name of Food, List of Ingredients, Nutritional data, Declaration with respect to Veg or Non veg, Declaration in regards to Food Additives, Name and complete location of the maker, Net amount, Lot/Code/Batch, distinguishing proof, Date of assembling or pressing, Best Before and Use By Date, Country of starting point for imported nourishment, Instructions for use (if Necessary).
Nourishing data isn't essential for tea. On the off chance that any flavour compound is included to the tea that ought to be referenced in the pocket. "CONTAINS ADDED Flavour" (normal or manufactured) proclamation will be shown underneath of fixings. Title classes alongside the International Numbering System (INS) or European (N) Number will be given on the mark. The net amount is to be referenced by weight. The net substance will be proclaimed in the decimal standard ("System International" units).

9.OFFENSES

Producer or packer of an article of sustenance will be at risk for such article of nourishment on the off chance that it doesn't meet the prerequisites of this Act and the standards and guidelines made there under.

Distributer or wholesaler will be at risk for any article of nourishment which is provided after the date of its expiry, put away or provided infringing upon the wellbeing guidelines of the maker, risky or misbranded, unidentifiable of producer from whom the article of sustenance have been gotten, put away or took care of or kept disregarding the arrangements of this Act, the principles and guidelines made hereunder, gotten by him with information of being dangerous.
Dealer will be obligated for any article of sustenance which is sold after the date of its expiry, took care of or kept in unhygienic conditions, misbranded, unidentifiable of the producer or the merchants from whom such articles of nourishment were gotten, gotten by him with learning of being hazardous.

10.OFFENSES BY COMPANIES

1. Where an offense submitted by an organization, each individual who is accountable for and is dependable to the organization for the lead of the matter of the organization, just as the organization, will be regarded to be liable of the offense and at risk to be continued against and rebuffed as needs be Provided that where an organization has distinctive foundations or branches or diverse units in any foundation or branch, the concerned Head or the individual accountable for such foundation, branch, unit selected by the organization as in charge of nourishment security will be subject for negation in regard of such foundation, branch or unit.
2. Despite anything contained in sub-area (1), where an offense under this Act has been submitted by an organization and it is demonstrated that the offense has been submitted with the assent or intrigue of or is owing to any disregard with respect to, any executive, administrator, secretary or other officer of the organization will likewise be esteemed to be blameworthy of that offense and will be subject to be continued against and rebuffed in like manner.

11.PENALTIES

S.No	Particulars	Penalties
1	Substandard food	upto Rs. 5.00 lakh (Sec 51)
2	Misbranded	Upto Rs. 3.00 lakhs (Sec 52)
3	Misleading advertisement	upto Rs. 10.00 lakhs (Sec 53)
4	Food with extraneous matter	upto Rs. 1.00 lakhs(Sec 54)
5	For failing to meet the requirements as directed by FSO	upto Rs. 2.00 lakhs (Sec 55)
6	Unhygienic / unsanitary conditions	upto Rs. 1.00 lakhs (Sec 56)
7	Adulterant not injurious to health	upto Rs. 2.00 lakhs (Sec 57)
8	Adulterant injurious to health	upto Rs. 10.00 lakhs (Sec 57)
9	Unsafe food – but does not cause immediate injury	six months imprisonment with fine of Rs.1.0 lakh (Sec 58)
10	Unsafe food causing non-grievous injury	1 year imprisonment with fine of Rs. 3.00 lakh (Sec 59)
11	Compensation in case for injury	upto Rs.1.00 lakh (Sec 59)
12	Causing grievous injury	six years imprisonment with fine of Rs. 5.00 lakh (Sec 59)
13	Compensation in case for grievous injury	upto Rs.3.00 lakh(Sec 59)
14	Causing death	7 years or life imprisonment and fine of Rs. 10.00 lakh (Sec 59)
15	Compensation in case of death	up to Rs. 5.00 lakh minimum (Sec 59)
16	Punishment for interfering with seized items	one year imprisonment with fine of Rs. 3.00 lakh (Sec 60)

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