File No. 11014/07/2021-QA

Food Safety and Standards Authority of India

(A statutory Authority established under the Food Safety and Standards Act, 2006)

(Quality Assurance Division)

FDA Bhawan, Kotla Road, New Delhi – 110002

Dated: 2nd April, 2024

Order

Subject: Revision of Method for Determination of Iron filings in Tea given under FSSAI Manual of Methods of Analysis of Foods- Beverages: Tea, Coffee and Chicory - reg.

The Method for Determination of Iron filings in Tea (FSSAI 04A.021:2023) has been revised.

2. The Method is enclosed herewith and the same has also been updated in the Manual of Methods of Analysis of Foods- Beverages: Tea, Coffee and Chicory.

2. This method shall be used by the laboratories with immediate effect.

3. Since the process of updation of test methods is dynamic, any changes happening from time to time will be notified separately. Queries/concerns, if any, may be forwarded to email: sp-sampling@fssai.gov.in, dinesh.k@fssai.gov.in.

Encl: as above

Dr. SATYEN KUMAR PANDA

Digitally signed by Dr. SATYEN KUMAR PANDA
Date: 2024.04.02 17:07:44 +05'30'

(Dr. Satyen Kumar Panda)
Advisor (QA)

To:

1. All FSSAI Notified Laboratories
2. All State Food Testing Laboratories
3. CEO, National Accreditation Board for Testing and Calibration Laboratories (NABL)

फा. सं. 11014/07/2021 – **क्यूए**
भारतीय खाद्य सुरक्षा और मानक प्राधिकरण
(खाद्य सुरक्षा और मानक अधिनियम, **2006** के अंतर्गत स्थापित एक वैधानिक प्राधिकरण**)**
(**गुणवत्ता आश्वासन विभाग**)
एफडीए भवन, कोटला रोड, नई दिल्ली-110002

दिनांक: 02 अप्रैल 2024

आदेश

विषय: खाद्य पदार्थों के विश्लेषण के तरीकों की एफएसएसएआई मैनुअल – पेय पदार्थ: चाय, कॉफ़ी और चिकोरी में दिये चाय में लौह भराव के निर्धारण की विधि के संशोधन - के संबंध में।

यह सूचित किया जाता है की चाय में आयरन भराव के निर्धारण की विधि (FSSAI 04A.021:2023) को संशोधित किया गया है।

2. विधि इसके साथ संलग्न है और इसे खाद्य पदार्थों-पेय पदार्थों: चाय, कॉफी और चिकोरी के विश्लेषण की विधियों के मैनुअल में भी अद्यतन किया गया है।

2. इस मैनुअल का प्रयोग प्रयोगशालाओं द्वारा तत्काल प्रभाव से किया जाएगा।

3. चूंकि परीक्षण विधियों के अद्यतन की प्रक्रिया गत्यात्मक है, समय-समय पर होने वाले किसी भी परिवर्तन को अलग से अधिसूचित किया जाएगा। प्रश्न/चिंताएं, यदि कोई हों, ईमेल: sp-sampling@fssai.gov.in, dinesh.k@fssai.gov.in पर अग्रेषित की जा सकती हैं ।

संलग्नक: उपरोक्त अनुसार

Dr. SATYEN KUMAR PANDA
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Date: 2024.04.02 17:08:07 +05'30'

(डॉ. सत्येन कुमार पंडा)
सलाहकार (गुणवत्ता आश्वासन)

प्रति:

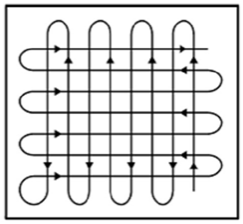
1. सभी एफएसएसएआई अधिसूचित प्रयोगशालाएं
2. सभी राज्य खाद्य परीक्षण प्रयोगशालाएं
3. सीईओ, राष्ट्रीय परीक्षण और अंशशोधन प्रयोगशाला प्रत्यायन बोर्ड

एफएसएसएआई fssai भारतीय खाद्य सुरक्षा और मानक प्राधिकरण Food Safety and Standards Authority of India स्वास्थ्य और परिवार कल्याण मंत्रालय Ministry of Health and Family Welfare	**Determination of Iron filings in Tea**		
Method No.	FSSAI 04A.021:2023	**Revision No. & Date**	1.0 - 02.04.2024
Scope	Procedure is applicable for determination of Iron filings in Tea.		
Caution	While testing, it is important that all procedural steps provided below are followed carefully and precisely. Greater attention would be required while spreading uniform thin uni-layer of Tea sample and moving magnet slowly just over tea layer.		
Principle	Iron filings or Iron particles may mainly enter in Tea, due to wear and tear of old processing machineries, making the product adulterated and deleteriously affecting its quality. This method follows the gravimetric estimation of iron particles using a magnet.		
Apparatus/Instruments	Magnet (Strength: 3500 $\pm$ 300 Gauss) – Duly Calibrated, Analytical balance (least count, 0.1mg)		
Materials and Reagents	White sheets, pestle & mortar and Petri dish		
Preparation of Reagents	Not Applicable		
Method of analysis	**A) Granular Black CTC and Dust Tea:** Grind the Sample finely in pestle & mortar to pass through 500 micron mesh. **B) Leaf Tea, Orthodox and Green Tea Leaves:** Grind the Sample finely in pestle & mortar to pass through 500 micron mesh. **Subsequently following Step 1-6 shall be uniformly followed for above type of samples** • **Step-1:** Take whole unit pack (250 g) sample, homogenize properly, spread and divide into 5 sub-lots of approximate 50g each (4 corners and center). Collect and pool approximate 10g from each of 5 sub-lots to get 5 representative replicate samples of 50g each. Spread in thin layer (~ 5 mm) on 5 separate white sheets. Use spatula for sample division and spreading. Follow steps 2-6 parallely for all 5 replicate samples.		



- **Step-2:** From each of above 5 replicates, weigh and use 20 g of sample for next step. Spread it to very thin layer (close to uni-layer; around 2 - 3 mm) on white sheet.

- **Step-3:** Slowly move the magnet (~ 3500 gauss strength) over thinly spread (around 2 - 3 mm height) tea sample, as above in the flow manner indicated in below diagram. Repeat this manual magnet movement multiple times over 5 min duration. Collect the iron particles sticking to magnet each time of movement and pool all onto a white sheet (Note: magnet should pass just above the surface of Tea powder).



- **Step-4:** Collected material (which may contain few tea particles also along with iron filings at this stage due electrostatic attraction) shall be transferred into glass petri dish. Put the petri dish with collected material in desiccator for about 15 min for demagnetization.
- **Step-5:** Grind the collected material with the help of pestle mortar and spread onto white paper and use magnet movement (2nd time) above the distance of around 0.5 -1.0 cm from the spread layer on paper. This second action of magnet collects only iron particles, leaving tea sample on paper.

<table>
<tr><td></td><td>

- **Step-6:** Take the weight of the collected iron particles, sticking on magnet, using analytical balance.

As above, Step 2-6 to be performed for all 5 replicate samples.
</td></tr>
<tr><td>Calculation with units of expression</td><td>

Calculation (mg/kg): $\frac{\text{Weight of the iron filings (mg) X 1000}}{\text{Weight of the sample (g)}}$

RESULT: Five values of Iron filings in five replicates of Tea sample
</td></tr>
<tr><td>Interpretation and Expression of Result</td><td>

<table>
<tr><th colspan="2">Sampling Plan</th><th colspan="2">Limit, mg/kg</th></tr>
<tr><th>n</th><th>c</th><th>m</th><th>M</th></tr>
<tr><td>5</td><td>2</td><td>250</td><td>300</td></tr>
</table>

n = Number of replicates, comprising sample
c = Maximum allowable number of units, having iron filing content above ‘m’
m = Iron filing limit, that may be exceeded in number of replicates, ‘c’
M = Iron filing limit, that no replicate sub-sample shall exceed
</td></tr>
<tr><td>Inference (Qualitative Analysis)</td><td>Not Applicable</td></tr>
<tr><td>Reference</td><td>IS 3633 : 2003</td></tr>
<tr><td>Approved by</td><td>Scientific Panel on Methods of Sampling and Analysis</td></tr>
</table>