



GOVERNMENT OF WEST BENGAL
OFFICE OF THE PRINCIPAL
Maulana Azad College



8, RAFI AHMED KIDWAI ROAD, KOLKATA 700013, INDIA

Phone: 033 2249-3737/2226-7814 e-mail: maulanaazadcollegekolkata@gmail.com

Website: <https://maulanaazadcollegekolkata.ac.in>

Summary Report, Meeting Notice, Meeting Resolution, Course Brochure
/Curriculum, Course outcomes, Evaluation procedure, Sample Certificate

6. Food Adulteration and Quality Management

Summary Report

Course Name: **"Food Adulteration and Quality Management"**

Course Code: **AD-CEM-22-23-02**

Organizing Department: **Department of Chemistry.**

Course Duration: **30 Hours (12.10-2022 - 03-11-2022).**

No. of Enrolled Students: **15**

No. of student completed the course: **15**

Course outcomes:

learners will be able to 1. Explain theoretical and practical knowledge about food quality 2. Develop skill in the various methods used to analyse different foods for their components and quality attributes. 3. Understand the process of food quality control. 4. Diagnose adulteration of commonly consumed food items. 5. Experience hands on training for determining food quality.



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Departmental Meeting Notice & Meeting Resolution

Department of Chemistry
Maulana Azad College
Notice: 02.11.2021

A Departmental meeting will be held on 17.11.2021 at 2:00 p.m. to introduce **ADD-ON** courses in our department. All are requested to attend the meeting positively.

Agenda:

1. Course Title(s) and Year(s) of Implementation
2. Selection of course coordinator(s).
3. Framing of course curriculum
4. Eligibility criteria of students
5. Evaluation procedure and Issue of certificate.

ganga
Head

Department of Chemistry



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in

MEMBERS PRESENT: —

1) <i>ganga</i>	6) <i>Ganji San</i>
2) <i>Rajesh Lal</i>	7) <i>Shirga</i>
3) <i>Son</i>	8) <i>Anura</i>
4) <i>Anurheji</i>	9)
5) <i>Semanta</i>	

Resolutions of the meeting: —

- 1) It is resolved that 2 Add-on courses based on hands-on-training/practical experiment ^{shall} ~~will~~ be conducted in the academic sessions 2021-22 and 2022-23
- 2) ~~It~~ It is resolved that course Titles of the 2 courses will be
 - i) Chemistry of life in session 2021-22
 - ii) Food Adulteration and Quality Management in 2022-23
- 3) Resolved that course duration shall be minimum 30 hours (as per UGC norms)



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- 4) Resolved that Coordinator for session 2021-22 Add-on course shall be Dr. Sucheta Singha, Associate Professor & Coordinator for session 2022-23 Add-on course shall be Dr. Gouram Kr. Mondal, Associate Professor.
- 5) Resolved that the Coordinators shall frame the course curriculum, duration of course & tentative schedule.
- 6) It is resolved that Eligibility of Add-on course shall be B.Sc. Chemistry 3rd year (Sem-6/5) and 2nd year (Sem-4/3) students of the department.
- 7) It is resolved that evaluation shall be made on the basis of Viva-voce after completion of the said course.
- 8) It is resolved that the Full Marks of the viva-voce shall be 25 marks.
- 9) Resolved that students shall be provided Grades after evaluation as follows: **A**
A → 90-100% marks; B → 80-89% ; C → 60-79% ; D → 40-59%
Below 40% is fail.
- 10) After successful completion of the course, securing >40% marks, students shall be provided with certificate.



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Course Brochure

**Maulana Azad College
Department of Chemistry
Add-on certificate course**

FOOD ADULTERATION AND QUALITY MANAGEMENT

Objectives:

Food adulteration means anything adding or subtracting with food making it injurious to health. This adulteration may be done intentionally or unintentionally. Intentional adulteration is a criminal act and punishable offense. So the main objectives of this course are to develop a crystal clear idea about food adulteration and analytical skill to detect it properly in our everyday life.

Food is one of the basic necessities for sustenance of life. Pure, fresh and healthy diet is most essential for the health of the people. It is no wonder to say that community health is national wealth. Adulteration of food-stuffs was so rampant, widespread and persistent that nothing short of a somewhat drastic remedy in the form of a comprehensive legislation became the need of the hour.

To check this kind of anti-social evil a concerted and determined onslaught was launched by the Government by introduction of the Prevention of Food Adulteration Bill in the Parliament to herald an era of much needed hope and relief for the consumers at large. About the middle of the 19th century chemical and microscopic knowledge had reached the stage that food substances could be analyzed, and the subject of food adulteration began to be studied from the standpoint of the rights and welfare of the consumer.

Course Duration:

Theoretical: 8 hours

Hands on: 22 hours

Total: 30 hours

Eligibility:

B. Sc. Chemistry Honours students

Curriculum:

Module:1 Detection of the presence of adulterants in fat, oil and butter

Module: 2 Detection of the presence of adulterants in sugar.

Module: 3 Detection the presence of adulterants in Beson.

Module: 4 Detection of the presence of starch in Milk.

Module: 5 Detection of the presence of adulterants in sample of chilli powder, turmeric powder and pepper

Module: 6 Detection of the presence of adulterants (Aluminium foil and starch) in Sweet

Evaluation:

Assessment of the students will be done through viva vice.

Certificates will be provided on successful completion of the course.



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Module:1 Detection of the presence of adulterants in fat, oil and butter

Experiment.1

AIM: To detect the presence of adulterants in fat, oil and butter

Apparatus/Reagents: Test-tube, conc. H_2SO_4 , acetic acid, conc. HNO_3 , alcohol, KOH and Ammonium Molybdate solution.

THEORY:

Common adulterants present in ghee and oil are paraffin wax, hydrocarbons, dyes and argemone oil. These are detected as follows:

(i) Adulteration of Vanaspati in Ghee:

Take a table spoon of melted ghee, add equal amount of Conc. H_2SO_4 in a test tube. Then add a pinch of sugar to it and shake well for 1 min and let stand for 5 mins. Appearance of crimson red colour in lower acid layer indicates presence Vanaspati in Ghee.

(ii) Adulteration of dyes in fat:

Heat 1mL of fat with a mixture of 1mL of conc. sulphuric acid and 4mL of acetic acid. Appearance of pink or red colour indicates presence of dye in fat.

(iii) Adulteration of argemone oil in edible oils (Mustard oil):

To small amount of oil in a test-tube, add few drops of conc. HNO_3 and shake. Appearance of red colour in the acid layer indicates presence of argemone oil.

(iv) Adulteration of mineral oil in Mustard oil:

Take 2 ml oil, add equal quantity of N/2 alcoholic KOH then heat in water bath for 15 mins and finally add 10 ml of water. Appearance of turbidity indicates the presence of mineral oil.

(v) Adulteration of Castor oil in Mustard oil:

Take 1 ml oil and add 10 ml of acidified pet ether. Mix well the mixture and finally add few drops of Ammonium Molybdate solution. Immediate appearance of white turbidity indicates the presence of Castor oil.

Module: 2 Detection of the presence of adulterants in sugar.

Experiment.2

AIM: To detect the presence of adulterants in sugar.

Apparatus/Reagents:: Test-tube, dil. HCl

THEORY:

Sugar is usually contaminated with washing soda and other insoluble substances which are detected as follows:

(i) Adulteration of various insoluble substances in sugar.



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Take a small amount of sugar in a test tube and shake it with little water. Pure sugar dissolves in water but insoluble impurities do not dissolve.

(ii) Adulteration of chalk powder, washing soda in sugar.

To a small amount of sugar in a test tube, add a few drops of dil HCl. Brisk effervescence of CO₂ shows the presence of chalk powder or washing soda in the given sample of sugar.

Module: 3 Detection the presence of adulterants in Beson.

Experiment.3

AIM: Detection of Khesari Dal in Beson.

Apparatus/Reagents:: Test-tube, dil. HCl

THEORY:

Beson powder is usually adulterated with Khesari Dal which contains butyl oxalyl alanine amine (BOAA) which causes lethargy and ultimate paralysis in lower limbs of human body on regular consumption.

The detection of BOAA in beson powder indicates adulteration of it with khesari dal.

Method:

To 1 gm of beson sample is taken in a test tube and 10 ml of 70% HCl is added to it. The content is boiled for some time.

Development of pinkish colour indicates adulteration of beson with khesari dal.

SL.NO.	SAMPLES	RESULT
1	Open sample	Adulterant present
2	Packed sample	Adulterant present

Module: 4 Detection of the presence of starch in Milk.

Experiment.4

AIM: Detection of starch in milk

Apparatus/Reagents:: Test-tube, Iodine solution.

THEORY:

Along with water, a very common adulterant of milk is starch. Milk consists of three basic components of which are as follows:

- Water (about 80%)
- Fat (about 3.5%)
- Minerals (about 8.5)
- Solid containing protein, lactose



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(v) Mineral matters (about 8.5%)

Milk is adulterated with starch to maintain the thickness of fat extracted milk or diluted milk.

Procedure:

At first 5 ml of milk sample is taken in a test tube and boiled for 3-4 minutes. Then it is cooled and 1-2 drops of iodine solution is added to it and is shaken well.

Appearance of blue colour indicates the presence of starch in the sample.

Table for different samples:

Sl. No.	Sample	Result
1	Amul TAZA	Adulterant absent
2	Amul	Adulterant absent
3	Nestle Everyday	Adulterant absent
4	Dairy milk	Adulterant Present

Module: 5 Detection of the presence of adulterants in sample of chilli powder, turmeric powder and pepper

Experiment 5

AIM: To detect the presence of adulterants in sample of chilli powder, turmeric powder and pepper

Apparatus/Reagents:: Test-tube, Conc. HCl, dil.HNO₃, KI solution.

PROCEDURE:

Common adulterants present in chilli powder, turmeric powder and pepper are red coloured lead salts, yellow lead salts and dried papaya seeds respectively. They are detected as follows:

(i) Adulteration of red lead in chilli powder.

To a sample of chilli add dil. HNO₃. Filter the solution, add 2 drops of KI solution to the filtrate. Yellow ppt. indicates the presence of lead salts in chilli powder.

(ii) Adulteration of yellow lead salts to turmeric powder.

To a sample of turmeric powder, add conc. HCl. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder.

(iii) Adulteration of brick in red chilli powder.



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Procedure:

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Table for different samples:

Sl. No.	Sample	Result
1	Amul TAZA	Adulterant absent
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3	Nestle Everyday	Adulterant absent
4	Dairy milk	Adulterant Present

Module: 5 Detection of the presence of adulterants in sample of chilli powder, turmeric powder and pepper

Experiment 5

AIM: To detect the presence of adulterants in sample of chilli powder, turmeric powder and pepper

Apparatus/Reagents:: Test-tube, Conc. HCl, dil.HNO₃, KI solution.

PROCEDURE:

Common adulterants present in chilli powder, turmeric powder and pepper are red coloured lead salts, yellow lead salts and dried papaya seeds respectively. They are detected as follows:

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(ii) Adulteration of yellow lead salts to turmeric powder.

To a sample of turmeric powder, add conc. HCl. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder.



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4	Adulteration of mineral oil in Mustard oil	Take 2 ml oil, add equal quantity of N/2 alcoholic KOH then heat in water bath for 15 mins and finally add 10 ml of water.	Appearance of turbidity.
5	Adulteration of Castor oil in Mustard oil	Take 1 ml oil and add 10 ml of acidified pet ether. Mix well the mixture and finally add few drops of Ammonium Molybdate solution.	Immediate appearance of white.
6	Adulteration of various insoluble substances in sugar	Take a small amount of sugar in a test tube and shake it with little water.	Pure sugar dissolves in water but insoluble impurities do not dissolve.
7	Adulteration of chalk powder, washing soda in sugar.	To a small amount of sugar in a test tube, add a few drops of dil.HCl	No brisk effervescence observed.
8	Adulteration of yellow lead salts to turmeric powder	To a sample of turmeric powder, add conc. HCl.	Appearance of magenta colour
9	Adulteration of red lead in chilli powder	To a sample of chilli add dil. HNO ₃ . Filter the solution add 2 drops of KI solution to the filtrate.	No yellow precipitate.
10	Adulteration of brick in red chilli powder	Add small amount of given red chilli powder in a beaker containing water	Brick powder settles down in the bottom while chilli powder floats over water.
11	Adulteration of dried papaya seeds in pepper	Add small amount of sample of pepper to a beaker containing water and stir with a glass rod	Dried papaya seeds being lighter floats over water while pure pepper settles at the bottom.
12	Adulteration of Aluminium foil in sweet.	Treated with conc. HCl followed by NH ₄ OH. Silver foil never dissolved in conc.	HCl. If the cover layer of sweet (foil) readily soluble in conc. HCl and reprecipitate on addition of NH ₄ OH.
13	Adulteration of Starch in sweet.	Add few drops of Iodine solution to the sample sweet.	Appearance of blue colour.



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Conclusion:

Selection of wholesome and non-adulterated food is essential for daily life to make sure that such foods do not cause any health hazard. It is not possible to ensure wholesome food only on visual examination when the toxic contaminants are present in ppm level. However, visual examination of the food before purchase makes sure to ensure absence of insects, visual fungus, foreign matters, etc. Therefore, due care taken by the consumer at the time of purchase of food after thoroughly examining can be of great help. Secondly, label declaration on packed food is very important for knowing the ingredients and nutritional value. It also helps in checking the freshness of the food and the period of best before use. The consumer should avoid taking food from an unhygienic place and food being prepared under unhygienic conditions. Such types of food may cause various diseases. Consumption of cut fruits being sold in unhygienic conditions should be avoided. It is always better to buy certified food from reputed shops.

Course outcomes: learners will be able to

1. Explain theoretical and practical knowledge about food quality
2. Develop skill in the various methods used to analyse different foods for their components and quality attributes.
3. Understand the process of food quality control.
4. Diagnose adulteration of commonly consumed food items.
5. Experience hands on training for determining food quality.




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Ref. No.

Date.....20

Add-on Course on "Food Adulteration and Quality Management"
Session 2022-2023

Course schedule (tentative)

Date	Duration	Topic/Session
12-10-2022	11:00 AM - 4:00 PM	Day-1: Theory + Hands-on-Practical
13-10-2022	11:00 AM - 4:00 PM	Day-2: Hands-on-Practical
14-10-2022	11:00 AM - 4:00 PM	Day-3: Hands-on-Practical
28-10-2022	11:00 AM - 4:00 PM	Day-4: Theory + Hands-on-Practical
29-10-2022	11:00 AM - 4:00 PM	Day-5: Hands-on-Practical
31-10-2022	11:00 AM - 4:00 PM	Day-6: Hands-on-Practical
01-11-2022	11:00 AM - 4:00 PM	Grand Viva + Evaluation
03-11-2022	11:00 AM - 2:00 P.M.	Certificate Distribution


Head

Department of Chemistry

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Sample Certificate

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No. _____		
<i>Course Completion Certificate</i>		
<p><i>This is to certify that _____, bearing Enrollment No. _____ has actively participated and successfully completed 30 hours add-on course on "Food Adulteration and Quality Management" organized by the Department of Chemistry in association with IQAC, in the period 12th October to 3rd November, 2022 and secured grade _____.</i></p>		
 Course Coordinator	 IQAC Coordinator	 Principal -



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