

## Chapter 1 : Project Work: Adultrance in food

*My Whats App: + Chemistry Project Report on Food Adulteration. Project Report FOOD ADULTERATION: INTRODUCTION. Food Adulteration: In our daily life there are so many unhygienic and contaminated things for our health.*

Taher Shabbir Hussain Class: Indian Public School Year: Shirley Zachariah , for her vital support, guidance and encouragement - without which this project would not have come forth. I would also like to express my gratitude to the lab assistant Mrs. Julie Sam for her support during the making of this project. Experiment 1 10 V. Experiment 2 11 VI. Experiment 3 12 VII. Bibliography 15 5 Page Downloaded from cbseportal. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer, diarrhoea, asthma, ulcers, etc. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. Several agencies have been set up by the Government of India to remove adulterants from food stuffs. Its objective is to promote the Grading and Standardization of agricultural and allied commodities.  $H_2SO_4$ , acetic acid, conc. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. Appearance of red colour in the acid layer indicates presence of argemone oil. Pure sugar dissolves in water but insoluble impurities do not dissolve. Brisk effervescence of  $CO_2$  shows the presence of chalk powder or washing soda in the given sample of sugar. They are detected as follows: Filter the solution and add 2 drops of potassium iodide solution to the filtrate. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Brick powder settles at the bottom while pure chilli powder floats over water. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom. Adulteration of Heat small amount of Appearance of oil paraffin wax and vegetable ghee with acetic floating on the hydrocarbon in anhydride. Droplets of oil surface. Adulteration of dyes Heat 1mL of fat with a Appearance of pink in fat mixture of 1mL of conc.  $H_2SO_4$  and 4mL of acetic acid. Adulteration of To small amount of oil in a No red colour argemone oil in edible test tube, add few drops of observed oils conc. Adulteration of Take small amount of sugar Pure sugar various insoluble in a test tube and shake it dissolves in water substances in sugar with little water. Adulteration of chalk To small amount of sugar in a No brisk powder, washing soda test tube, add a few drops of effervescence in sugar dil. Adulteration of To sample of turmeric Appearance of yellow lead salt to powder, add conc. Adulteration of red To a sample of chilli powder, No yellow ppt. Filter the powder solution and add 2 drops of KI solution to the filtrate. Adulteration of brick Add small amount of given Brick powder settles powder in chilli red chilli powder in a beaker at the bottom while powder containing water. Adulteration of dried Add small amount of sample Dried papaya seeds papaya seeds in of pepper to beaker being lighter float pepper containing water and stir over water while with a glass rod. 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 shop.

### Chapter 2 : Chemistry Project - Detection of adultration in food - The Chemistry Guru

*Objective. The Objective of this project is to study some of the common food adulterants present in different food stuffs. Adulteration in food is normally present in its most crude form; prohibited substances are either added or partly or wholly substituted.*

Adulterants in oil, butter, and fat. Test-tube, acetic anhydride, conc.  $H_2SO_4$ , acetic acid, conc. These are detected as follows: Droplets of oil swimming on the surface of remaining acetic anhydride unusual the appearance of wax or hydrocarbons when some Flame apply the small amount of vegetable ghee with acetic anhydride. Presence of red color indicates the presence of dye in fat. Presence of red color in the acid layer indicates the presence of argemone oil. Active bubbling of  $CO_2$  shows the presence of chalk powder or washing soda in the given sample of sugar. Pure sugar dissolves in water, but insoluble impurities do not disappear. Adulterants in samples of chili powder. Procedure to detected as follows. Filter the solution and add two drops of potassium iodide solution to the filtrate. Confirms the presence of lead salts in chili powder. Brick powder sinks at the bottom while pure chili powder floats over water. Use two grams of the samples in a test tube, add few ml of solvent ether and shake, Decant ether layer into a test tube containing 2ml of dilute Hydrochloric acid. Shake it; the lower acid layer will be colored distinct pink to the red indicating presence of oil soluble color. Dried papaya seeds being lighter float over water while unadulterated pepper settles at the base. Swim the sample of black pepper in alcohol rectified spirit. The ripe black pepper berries sink while the papaya seeds and light black pepper float. Procedure is detected as follows. The appearance of magenta color shows the presence of yellow oxides of lead in turmeric powder. Add a few drops of concentrated  $HCl$ ; effervescence will indicate the presence of chalk or yellow soapstone powder. Tests for food Adulteration:

**Chapter 3 : Food adulteration chemistry project work | EduRev Notes**

*Chemistry investigatory about adulteration in food stuffs Slideshare uses cookies to improve functionality and performance, and to provide you with relevant advertising. If you continue browsing the site, you agree to the use of cookies on this website.*

Taher Shabbir Hussain Class: Indian Public School Year: Shirley Zachariah, for her vital support, guidance and encouragement - without which this project would not have come forth. I would also like to express my gratitude to the lab assistant Mrs. Julie Sam for her support during the making of this project. Theory 9 on IV. Experiment 1 10 V. Experiment 2 11 VI. Experiment 3 12 VII. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of E. It is equally important for the consumer to know the common adulterants and their effect on health. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening tests for their detection. In the past few decades, adulteration of food has become one of the E. Consumption of adulterated food causes serious diseases like cancer, diarrhoea, asthma, ulcers, etc. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. BS Several agencies have been set up by the Government of India to remove adulterants from food stuffs. Its objective is to promote the Grading and Standardization of agricultural and allied commodities. H<sub>2</sub>SO<sub>4</sub>, acetic acid, conc. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. HNO<sub>3</sub> and shake. Appearance of red colour in the acid layer indicates presence of argemone oil. Pure sugar dissolves in water but insoluble impurities do not dissolve. BS Brisk effervescence of CO<sub>2</sub> shows the presence of chalk powder or washing soda in the given sample of sugar. They are detected as follows: Filter the solution and add 2 drops of potassium iodide solution to the filtrate. BS ii Adulteration of yellow lead salts to turmeric powder To a sample of turmeric powder add conc. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Brick powder settles at the bottom while pure chilli powder floats over water. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom. Adulteration of Heat small amount of Appearance of oil paraffin wax and vegetable ghee with acetic floating on the hydrocarbon in anhydride. Droplets of oil surface. Adulteration of dyes Heat 1mL of fat with a Appearance of pink in fat mixture of 1mL of conc. H<sub>2</sub>SO<sub>4</sub> and 4mL of acetic acid. Adulteration of To small amount of oil in a No red colour argemone oil in edible test tube, add few drops of observed E. Adulteration of Take small amount of sugar Pure sugar various insoluble in a test tube and shake it dissolves in water substances in sugar with little water. Adulteration of chalk To small amount of sugar in a No brisk powder, washing soda test tube, add a few drops of effervescence in sugar dil. Adeulteration of To sample of turmeric Appearance of yellow lead salts to powder, add conc. Adulteration of red To a sample of chilli powder, No yellow ppt. Filter the powder solution and add 2 drops of KI solution to the filtrate. Adulteration of brick Add small amount of given Brick powder settles powder in chilli red chilli powder in a beaker at the bottom while powder containing water. Adulteration of dried Add small amount of sample Dried papaya seeds papaya seeds in of pepper to beaker being lighter float pepper containing water and stir over water while with a glass rod. 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. 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 shop.

## Chapter 4 : Food Adulteration Project - Seminar Projects Topics

*The Objective of this project is to study some of the common adulterance present in different food stuffs. Adulteration in food is normally present in its most crude calendrierdelascience.comited substances are either added or partly or wholly substituted.*

To protect the public from poisonous and harmful foods 2. To prevent the sale of substandard foods 3. To protect the interests of the consumers by eliminating fraudulent practices

**Meaning of Adulterant:** Any material which is or could be employed for the purposes of adulteration

**Definition of Food:** Any article which ordinarily enters into or is used in the composition or preparation of human food

b. Any flavouring matter or condiments and

c. Any other article which the Central Government may having regard to its use, nature, substance or quality, declare, by notification in the official gazette as food for the purpose of this Act.

**B Concept of Adulteration:**

**Scorched Persimmon stones adulterant**

**Chemical test:** Take 1 teaspoon of the coffee powder and spread it on a moisturized blotting paper. A red coloration indicates the presence of the powder of Scorched Persimmon Stones in the Coffee Powder.

**Rhodamine B colour adulterant**

**Chemical test:** Take a red chilly for the dry red chilly, and rub the outer surface with a piece of cotton soaked in Liquid Paraffin. If the cotton becomes red, the sample is adulterated. Take a cotton piece soaked in Liquid Paraffin, and rub the dry piece of turmeric root. If the cotton becomes yellow, we can say that the turmeric root has been adulterated with Metanil Yellow colour.

**Sodium Bicarbonate**

**Chemical test:** Add 3 ml of Muratic Acid. The presence of Sodium Carbonate effects effervescence.

**Metanil Yellow Colour**

**Chemical test:** Add 3 ml of alcohol and shake the tube vigorously to mix up the contents. Pour 10 drops of Hydrochloric Acid in it. A pink colouration indicates the presence of Metanil Yellow Colour in Jaggery. Take 3 ml of the milk in a test tube. Add 10 drops of rosalic acid solution. The rosy colouration indicates the presence of sodium bicarbonate in the milk. Keep the marble in a slanted position, the milk containing water moves downward faster as compared to milk with water.

**Rhodamine B colour**

**Chemical test:** Take a cotton piece soaked in Liquid Paraffin, and rub the outer red surface of the sweet potato. If the cotton absorbs colour, it indicates the use of Rhodamine B colour on outer surface of the sweet potato.

**Metanil Yellow colour**

**Chemical test:** Add 3 ml of alcohol in it. Shake the tube thoroughly to mix up the contents. Add 10 drops of Muratic Acid or Hydrochloric Acid in the test tube. A pink colouration indicates the presence of Metanil Yellow colour in the Turmeric Powder.

## Chapter 5 : Food Adulteration: Science Project: Food Adulteration

*Chemistry Project - Detection of adulteration in food EXPERIMENT 1 Download Pdf AIM: To detect the presence of adulterants in fat, oil and butter.*

Bibliography 15 The Objective of this project is to study some of the c. Adulteration in food is normally present in its most crude form; prohibited substances are either added or partly or wholly substituted. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health. TffIDRy The increasing number of food producers and the outstanding amount of import foodstuffs enables the producers to mislead and cheat consumers. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening, tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer,. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. Its objective is to promote the Grading and Standardization of agricultural and allied commodities. To detect the presence of adulterants in fat, oil and butter. H<sub>2</sub>SO<sub>4</sub>, acetic acid, conc. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. Appearance of red colour in the acid layer indicates presence of argemone oil. Pure sugar dissolves in water but insoluble impurities do not dissolve. Brisk effervescence of CO<sub>2</sub> shows the presence of chalk powder or washing soda in the given sample of sugar. They are detected as follows: Filter the solution and add 2 drops of potassium iodide solution to the filtrate. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Brick powder settles at the bottom while pure chilli powder floats over water. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom.

**Chapter 6 : [PDF] Class 12 Chemistry CBSE Investigatory Project on Adulteration in Food**

*Chemistry Investigatory Project on FOOD ADULTERATION. It is a full project on food adulteration for 11th & 12th class students.*

Adulterance in food How to identify Adulterance The Objective of this project is to study some of the common adulterance present in different food stuffs. Adulteration in food is normally present in its most crude form. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health. Theory The increasing number of food producers and the outstanding amount of import foodstuffs enables the producers to mislead and cheat consumers. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening, tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer, diarrhoea, asthma, ulcers, etc. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. Its objective is to promote the Grading and Standardization of agricultural and allied commodities. To detect the presence of adulterants in fat, oil and butter. Test-tube, acetic anhydride, conc.  $H_2SO_4$ , acetic acid, conc. Common adulterants present in ghee and oil are paraffin wax, hydrocarbons, dyes and argemone oil. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. Appearance of red colour in the acid layer indicates presence of argemone oil. Sugar is usually contaminated with washing soda and other insoluble substances which are detected as follows: Brisk effervescence of  $CO_2$  shows the presence of chalk powder or washing soda in the given sample of sugar. Pure sugar dissolves in water but insoluble impurities do not dissolve. To detect the presence of adulterants in samples of chilli powder. They are detected as follows. Filter the solution and add 2 drops of potassium iodide solution to the filtrate. Brick powder settles at the bottom while pure chilli powder floats over water. Take 2 gms of the samples in a test tube, add few ml of solvent ether and shake, Decant ether layer into a test tube containing 2ml of dilute Hydrochloric acid. Shake it, the lower acid layer will be coloured distinct pink to red indicating presence of oil soluble colour. To detect the presence of adulterants in samples of turmeric powder. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Add a few drops of conc. HCL, effervescence will indicate the presence of chalk or yellow soap stone powder. To detect the presence of adulterants in samples of pepper. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom. Float the sample of black pepper in alcohol rectified spirit. The mature black pepper berries sink while the papaya seeds and light black pepper float. If palms turn black adulteration is indicated. To detect the presence of adulterants in samples of cloves. The characteristic pungent tests of genuine cloves is less pronounced in exhausted cloves. To detect the presence of adulterants in samples of Hing. Shake little portion of the sample with water and allow to settle. Soap stone or other earthy matter will settle down at the bottom. Shake sample with Carbon tetrachloride  $CCl_4$ . Asafoetida will settle down. Decant the top layer and add dil. HCl to the residue. Mustard seeds have a smooth surface. The argemone seed have grainy and rough surface and are black and hence can be separated out by close examination. When Mustard seed is pressed inside it is yellow while for argemone seed it is white. Dung will float and can be easily detected by its foul smell. Of sample add a few drops of silver nitrate. White precipitate indicates adulteration. Separate out the seeds by physical examination. The seeds of BadiElaichi have nearly plain surface without wrinkles or streaks while seeds of cardamom have pitted or wrinkled ends. Genuine saffron will not break easily like artificial. Food Article Method for detection of Common Adulterants a. Black pepper Papaya seeds Papaya seeds can be separated out from pepper as they are shrunken, greenish brown or brownish black in

colour. Light black pepper Float the sample of black pepper in alcohol. Coated with mineral oil Black pepper coated with mineral oil gives Kerosene like smell. Cloves Volatile oil extracted exhausted cloves Exhausted cloves can be identified by its small size and shrunken appearance. Mustard seed Argemone seed Mustard seeds have a smooth surface. But argemone seed have rough surface and are black and hence can be separated out. Chillies powder Water soluble coal tar colour They can be detected by sprinkling small quantity of chillies or turmeric powder on the surface of water contained in a glass tumbler. The water soluble colour will immediately start descending in colour streaks. Oil soluble coal tar colour Take 2 gms of the samples in a test tube, add few ml of solvent ether and shake, Decant ether layer into a test tube containing 2ml of dilute Hydrochloric acid. Hing Soap stone or other earthy matter Shake little portion of the sample with water and allow to settle. Saffron Dried tendrils of maize cob Genuine saffron will not break easily like artificial. 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 shop. Turmeric is the basic ingredient of all our Indian cooking. Any Indian dish is not complete without it. But before you buy your next quota of this "masala" be careful of what you are buying. It may be adulterated with, Lead chromate, which adds color as well as weight to it, being heavier, Metanil Yellow dye Or any starch based items like flour or rice powder or even industrial starch. Except flour or rice powder, all the other adulterants are health hazardous and cause irreparable damage to our system when eaten at regular intervals for a long period of time. Take for instance Lead chromate, it is one of the most toxic salts of lead. It can cause anemia, paralyses, mental retardation and brain damage in children and abortion in pregnant women. Metanil yellow dye which is another non-permissible toxic colorant, is used mostly to color Besan or gram flour, pulses, miscellaneous prepared foods namely sweetmeats like laddoo, burfi, jilabi, dalmoth, papad, etc. Food grade colors are available in the market but being more costly, traders take advantage of the lackadaisical approach of the law enforcing authorities and substitute it with the said cheap and non-permissible dyes and colors which cause damage to People health. While still on "Masalas" or spices, does one know what are the common adulterants, take for instance, for coriander powder or chili powder-sawdust, rice bran and sand. One cannot even imagine or fathom- horse-dung and cow-dung! This is not only unethical, from the business point of view, but a sin committed against the society at large. Any trader who is found resorting to such means of adulterations should be taken to task very strongly. People should try as far as possible to buy whole spices and grind them at home or purchase properly packed spices with proper informative labeling of standard F.

## Chapter 7 : Adulterant - Wikipedia

*Food and Adulteration is a Practical Topic of Subject Chemistry of class 12th. In this practical file, ways are give in order to do experiments to find the adulterants in different products.*

**Bibliography Objective** The Objective of this project is to study some of the common food adulterants present in different food stuffs. Adulteration in food is normally present in its most crude form; prohibited substances are either added or partly or wholly substituted. This ultimately results that the consumer is either cheated or often become a victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health. **THEORY** The increasing number of food producers and the outstanding amount of import foodstuffs enables the producers to mislead and cheat consumers. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behaviour may endanger consumer health and misleading can lead to poisoning. So we need simple screening, tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer,. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. This organization certifies food products for their quality. Its objective is to promote the Grading and Standardization of agricultural and allied commodities.  $H_2SO_4$ , acetic acid, conc. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. Appearance of red colour in the acid layer indicates presence of argemone oil. Pure sugar dissolves in water but insoluble impurities do not dissolve. Brisk effervescence of  $CO_2$  shows the presence of chalk powder or washing soda in the given sample of sugar. They are detected as follows: Filter the solution and add 2 drops of potassium iodide solution to the filtrate. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Brick powder settles at the bottom while pure chilli powder floats over water. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom.

**Chapter 8 : Adulterants in Food - Chemistry Project - Notes For Free**

*An article of food shall be deemed to be adulterated: If the article sold by vendor is not of the nature, substance or quality demanded by the purchaser If the article contains any other substance which affects the substance or quality thereof.*

Food Adulteration by Akshay Takale How to identify Adulterance The Objective of this project is to study some of the common adulterance present in different food stuffs. Adulteration in food is normally present in its most crude form. This ultimately results that the consumer is either cheated or often become victim of diseases. Such types of adulteration are quite common in developing countries or backward countries. It is equally important for the consumer to know the common adulterants and their effect on health. Theory The increasing number of food producers and the outstanding amount of import foodstuffs enables the producers to mislead and cheat consumers. To differentiate those who take advantage of legal rules from the ones who commit food adulteration is very difficult. The consciousness of consumers would be crucial. Ignorance and unfair market behavior may endanger consumer health and misleading can lead to poisoning. So we need simple screening, tests for their detection. In the past few decades, adulteration of food has become one of the serious problems. Consumption of adulterated food causes serious diseases like cancer, diarrhoea, asthma, ulcers, etc. Majority of fats, oils and butter are paraffin wax, castor oil and hydrocarbons. Red chilli powder is mixed with brick powder and pepper is mixed with dried papaya seeds. These adulterants can be easily identified by simple chemical tests. Its objective is to promote the Grading and Standardization of agricultural and allied commodities. To detect the presence of adulterants in fat, oil and butter. Test-tube, acetic anhydride, conc.  $H_2SO_4$ , acetic acid, conc. Common adulterants present in ghee and oil are paraffin wax, hydrocarbons, dyes and argemone oil. These are detected as follows: Droplets of oil floating on the surface of unused acetic anhydride indicates the presence of wax or hydrocarbons. Appearance of pink or red colour indicates presence of dye in fat. Appearance of red colour in the acid layer indicates presence of argemone oil. Sugar is usually contaminated with washing soda and other insoluble substances which are detected as follows: Brisk effervescence of  $CO_2$  shows the presence of chalk powder or washing soda in the given sample of sugar. Pure sugar dissolves in water but insoluble impurities do not dissolve. To detect the presence of adulterants in samples of chilli powder. They are detected as follows. Filter the solution and add 2 drops of potassium iodide solution to the filtrate. Brick powder settles at the bottom while pure chilli powder floats over water. Take 2 gms of the samples in a test tube, add few ml of solvent ether and shake, Decant ether layer into a test tube containing 2ml of dilute Hydrochloric acid. Shake it, the lower acid layer will be coloured distinct pink to red indicating presence of oil soluble colour. To detect the presence of adulterants in samples of turmeric powder. Appearance of magenta colour shows the presence of yellow oxides of lead in turmeric powder. Add a few drops of conc. HCL, effervescence will indicate the presence of chalk or yellow soap stone powder. To detect the presence of adulterants in samples of pepper. Dried papaya seeds being lighter float over water while pure pepper settles at the bottom. Float the sample of black pepper in alcohol rectified spirit. The mature black pepper berries sink while the papaya seeds and light black pepper float. If palms turn black adulteration is indicated. To detect the presence of adulterants in samples of cloves. The characteristic pungent tests of genuine cloves is less pronounced in exhausted cloves. To detect the presence of adulterants in samples of Hing. Shake little portion of the sample with water and allow to settle. Soap stone or other earthy matter will settle down at the bottom. Shake sample with Carbon tetrachloride  $CCl_4$ . Asafoetida will settle down. Decant the top layer and add dil. HCl to the residue. Mustard seeds have a smooth surface. The argemone seed have grainy and rough surface and are black and hence can be separated out by close examination. When Mustard seed is pressed inside it is yellow while for argemone seed it is white. Dung will float and can be easily detected by its foul smell. Of sample add a few drops of silver nitrate. White precipitate indicates adulteration. Separate out the seeds by physical examination. The seeds of Badi Elaichi have nearly plain surface without wrinkles or streaks while seeds of cardamom have pitted or wrinkled ends. Genuine saffron will not break easily like artificial.

**Chapter 9 : CBSE Projects Chemistry, C++, Physics, Maths, Biology, IP, Disaster Management**

*The Objective of this project is to study some of the calendrierdelascience.com calendrierdelascience.com present in different food stuffs. Adulteration in food is normally present in its most crude form; prohibited substances are either added or partly or wholly substituted.*

Food also meets the definition of adulteration if: Further, food is considered adulterated if: Poisonous or deleterious substances[ edit ] Generally, if a food contains a poisonous or deleterious substance that may render it injurious to health, it is considered to be adulterated. For example, apple cider contaminated with E. H7 and Brie cheese contaminated with *Listeria monocytogenes* are adulterated. There are two exceptions to this general rule. First, if the poisonous substance is inherent or naturally occurring and its quantity in the food does not ordinarily render it injurious to health, the food will not be considered adulterated. Thus, a food that contains a natural toxin at very low levels that would not ordinarily be harmful for instance, small amounts of amygdalin in apricot kernels is not adulterated. Second, if the poisonous or deleterious substance is unavoidable and is within an established tolerance, regulatory limit, or action level , the food will not be deemed to be adulterated. Tolerances and regulatory limits are thresholds above which a food will be considered adulterated. They are binding on FDA, the food industry, and the courts. Action levels are limits at or above which FDA may regard food as adulterated. They are not binding on FDA. FDA has established numerous action levels for example, one part per million methylmercury in fish , which are set forth in its booklet Action Levels for Poisonous or Deleterious Substances in Human Food and Animal Feed. If a food contains a poisonous substance in excess of a tolerance, regulatory limit, or action level, mixing it with "clean" food to reduce the level of contamination is not allowed. Filth and foreign matter of adulteration[ edit ] Filth and extraneous material include any objectionable substances in foods, such as foreign matter for example, glass, metal, plastic, wood, stones, sand, cigarette butts , undesirable parts of the raw plant material such as stems, pits in pitted olives , pieces of shell in canned oysters , and filth namely, mold , rot , insect and rodent parts, excreta , decomposition. FDA regulations, however, authorize the agency to issue Defect Action Levels DALs for natural, unavoidable defects that at low levels do not pose a human health hazard [21 C. In most cases, DALs are food-specific and defect-specific. Economic-adulteration[ edit ] A food is adulterated if it omits a valuable constituent or substitutes another substance, in whole or in part, for a valuable constituent for instance, olive oil diluted with tea tree oil ; conceals damage or inferiority in any manner such as fresh fruit with food coloring on its surface to conceal defects ; or any substance has been added to it or packed with it to increase its bulk or weight, reduce its quality or strength, or make it appear bigger or of greater value than it is for example, scallops to which water has been added to make them heavier. Microbiological contamination and adulteration of food[ edit ] The fact that a food is contaminated with pathogens harmful microorganisms such as bacteria , viruses , or protozoa may, or may not, render it adulterated. Generally, for ready-to-eat foods, the presence of pathogens will render the food adulterated. For example, the presence of *Salmonella* on fresh fruits or vegetables or in ready-to-eat meat or poultry products such as luncheon meats will render those products adulterated. For meat and poultry products, which are regulated by USDA, the rules are more complicated. Ready-to-eat meat and poultry products contaminated with pathogens, such as *Salmonella* or *Listeria monocytogenes*, are adulterated. Note that hotdogs are considered ready-to-eat products. For raw meat or poultry products, the presence of pathogens will not always render a product adulterated because raw meat and poultry products are intended to be cooked, and proper cooking should kill pathogens. Raw poultry contaminated with *Salmonella* is not adulterated. This is because normal cooking methods may not reduce E. H7 below infectious levels. H7 is the only pathogen that is considered an adulterant when present in raw meat or poultry products. They are of various types. These include seizing and condemning the product, detaining imported product, enjoining persons from manufacturing or distributing the product, or requesting a recall of the product. Enforcement action is usually preceded by a Warning Letter from FDA to the manufacturer or distributor of the adulterated product. In the case of an adulterated meat or poultry product, FSIS has certain additional powers. FSIS may suspend or withdraw federal inspection of an official establishment. Without

federal inspection, an establishment may not produce or process meat or poultry products, and therefore must cease operations. With the exception of infant formula , neither FDA nor FSIS has the authority to require a company to recall an adulterated food product. However, the ability to generate negative publicity gives them considerable powers of persuasion. State regulators generally have similar enforcement tools at their disposal to prevent the manufacture and distribution of adulterated food. In addition, many states have the authority to immediately embargo adulterated food and to impose civil fines. Federal agencies often will coordinate with state or local authorities to remove unsafe food from the market as quickly as possible.