# Food borne diseases, Food fortification, and Food adulteration, Food toxicants,

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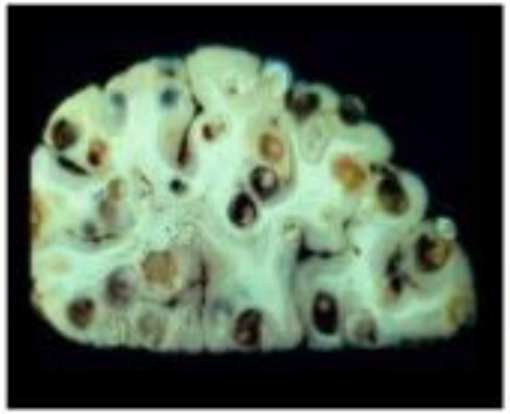
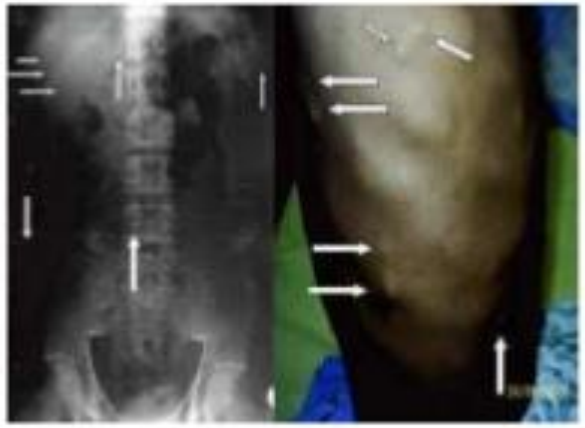
# Food borne diseases

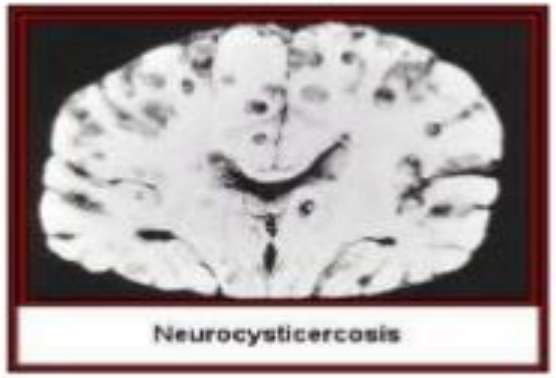
Human cysticercosis :

resulting from infection with the larval stage of the pork tapeworm, Taenia solium – is a modern human plague, affecting thousands of people world-wide. In the normal cycle of transmission of this tapeworm, humans harbor the adult parasite in the small intestine as definitive hosts.

# Human Cysticercosis








- Prevention and control measures

proper treatment
meat inspection
health education
proper sewage treatment
proper cooking of meat

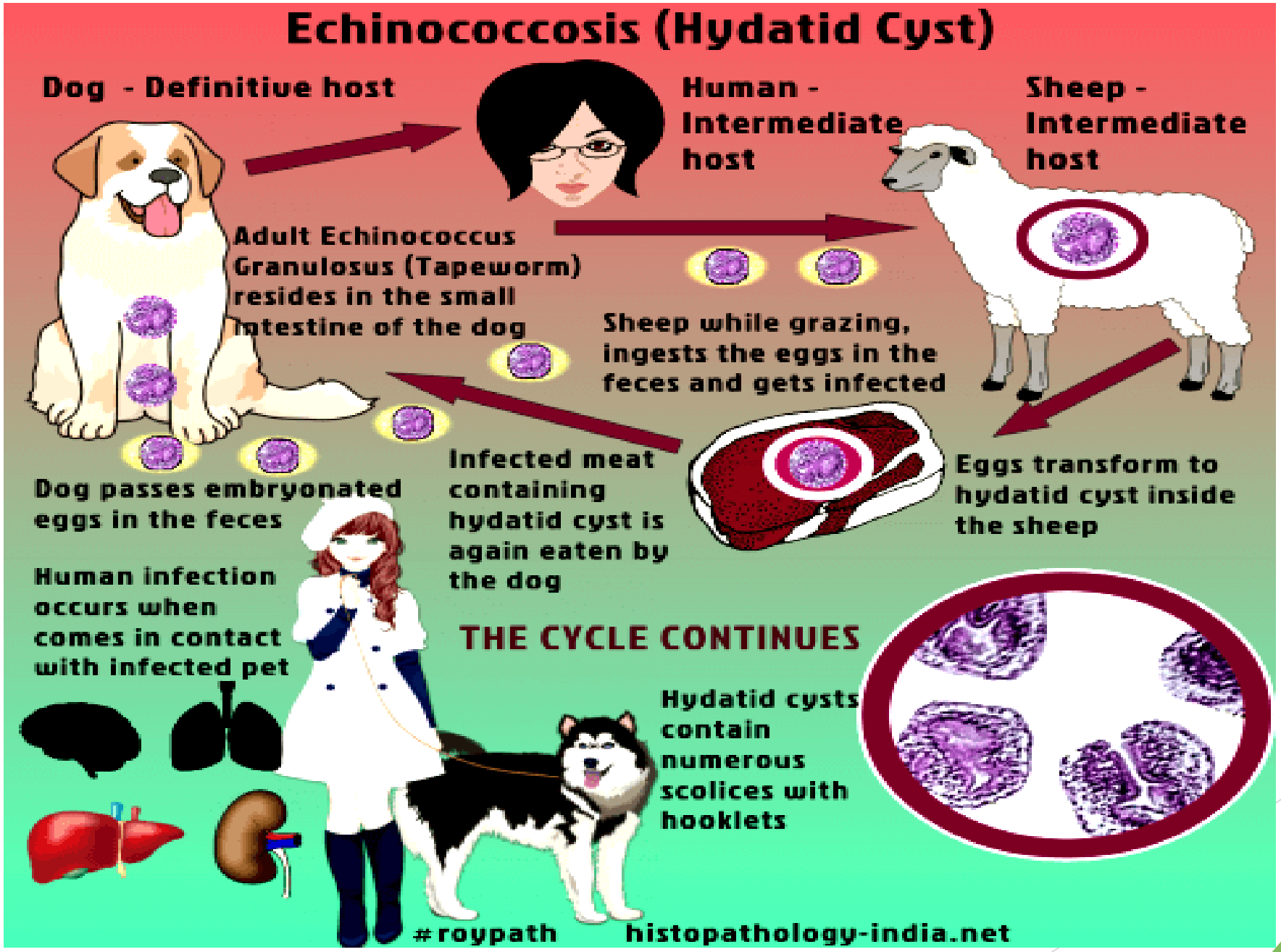
management-
praziquantel single dose of 10mg/kg body weight & niclosamide 2 gm in one dose are effective.

# Hydatid disease

- Hydatid disease, also known as echinococcosis, or cystic hydatid disease, is caused by an infection with the larvae of the tapeworm *Echinococcus granuloses*. This parasite causes slow-growing cystic formation and associated symptoms that depend on cyst location.

# Transmission of the Disease

- During maturation of the distal proglottid(gravid and contains eggs in a uterus), separation from the main body of the tapeworm occurs and subsequently disintegrates releasing ova which can then be passed into feces. Any ova released may contaminate grass, vegetables or the fur of animals which excreted the ova. If animals then feed on the grass containing the ova, they then can become infected and become an intermediate host for the parasite. Definitive hosts are those that consume infected intestines from the intermediate hosts.


Echinococcosis (Hydatid Cyst)
Dog - Definitive host
Human - Intermediate host
Sheep - Intermediate host
Adult Echinococcus Granulosus (Tapeworm) resides in the small intestine of the dog
Sheep while grazing, ingests the eggs in the feces and gets infected
Dog passes embryonated eggs in the feces
Infected meat containing hydatid cyst is again eaten by the dog
Eggs transform to hydatid cyst inside the sheep
Human infection occurs when comes in contact with infected pet
THE CYCLE CONTINUES
Hydatid cysts contain numerous scolices with hooklets
#roypath
histopathology-india.net

# The symptoms of hydatid disease

- Cysts that develop in cases of hydatid disease are often slow-growing which means that the infection may not produce noticeable symptoms until a few years following the initial ingestion.
- In cases where symptoms do develop, they are dependent on where the cyst is located. For example, if lodged in the liver, nausea, vomiting and abdominal pain may be experienced. If found in the lung, individuals may develop chest pain, shortness of breath and a chronic cough.

# Treatments

- Research has found that the only effective method of treating cases of hydatid disease is through surgical removal of the cysts followed by a course of chemotherapy.

# Prevention

- Currently, there aren’t any preventative methods such as vaccines to protect humans against developing the disease. However, certain measures such as not feeding dogs uncooked food, washing hands thoroughly after being in contact with dogs, washing fruit and vegetables before cooking and eating them can be taken to reduce the likelihood of contracting the disease.

# Food poisoning

- Food poisoning is a common infectious condition that affects millions of people in the world each year.
- Most commonly, people complain of
  - vomiting,
  - diarrhea, and
  - cramping abdominal pain.

# What is food poisoning?

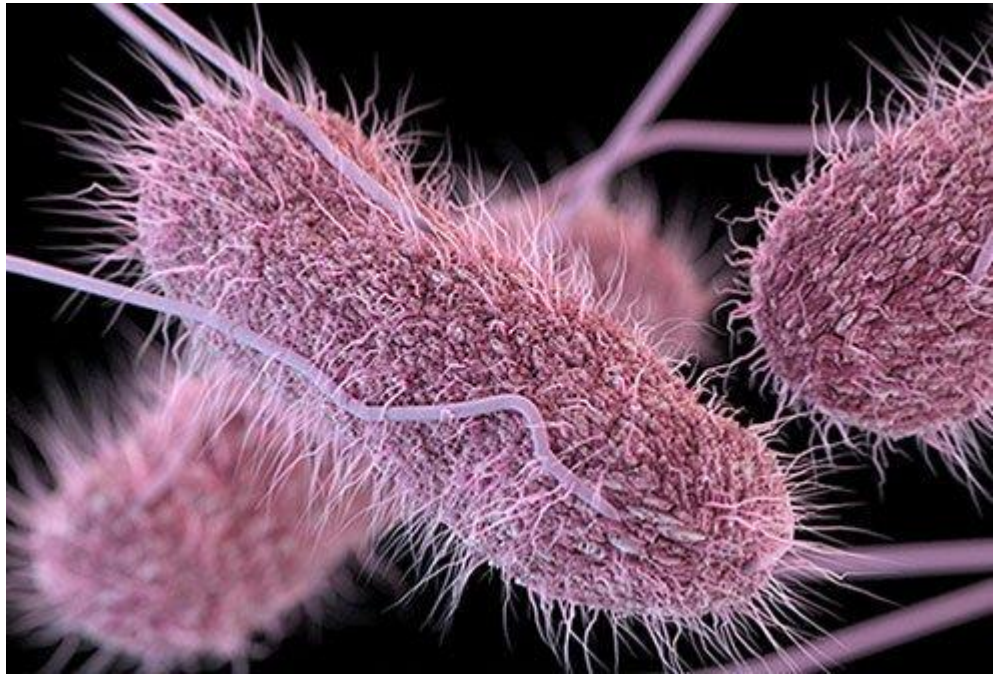
- Food poisoning is a food borne disease. Ingestion of food that contains a toxin, chemical or infectious agent (like a bacterium, virus, parasite, or prion) may cause adverse symptoms in the body. Those symptoms may be related only to the gastrointestinal tract
causing vomiting or diarrhea or they may involve other organs such as the kidney, brain, or muscle.
- Typically most foodborne diseases cause vomiting and diarrhea that tend to be short lived and resolve on their own, but dehydration and electrolyte abnormalities may develop.

# Types of food poisoning

- The most common types of bacteria that cause food poisoning are
- salmonella,
- shigella,
- campylobacter,
- E. coli.
- Botulism
- Clostridium. perfringens

# *Salmonella* food poisoning

- *Salmonella* bacteria live in the intestinal tract of humans and animals and are excreted in feces. Poultry, beef, milk, and eggs all can contain *Salmonella* bacteria.
- *Salmonella* infection is a foodborne illness that occurs from consumption of raw meats and eggs, contaminated dairy foods such as unpasteurized (raw) milk, or fruits and vegetables contaminated by food handlers.



- A *Salmonella* bacterial infection causes gastrointestinal symptoms, including diarrhoea
- abdominal pain
- nausea
- vomiting

- Symptoms develop within 12-72 hours and typically last four to seven days.
- The most common are S. *typhimurium, S. enteritidis and S.cholerasuis*. Some types of *Salmonella* bacteria cause the illness known as typhoid fever.
- In most cases, no specific treatment is needed other than adequate hydration.
- Most cases of salmonellosis are not life-threatening and resolve on their own without complications.
- People at risk for complications or those with particularly severe illness or a weakened immune system may need antibiotic therapy.
- There is no vaccine to prevent *Salmonella* infection.
- *Salmonella* may infect reptiles, rodents, and birds. Contact with these animals increases the likelihood of getting the infection.
- People may prevent infection by following established food safety practices, including attention to hygiene during food preparation and handling of animals.

# Causes of salmonella poisoning

- Poultry, beef, milk, and eggs may contain *Salmonella* bacteria, since the bacteria live in the intestines of humans and animals. Thorough cooking of these foods destroys the bacteria.
- Foods, including vegetables and fruits, may also be contaminated during handling or processing of the food, and this is another common source of outbreaks. For example, food may be contaminated by the feces of infected people or animals or from the unwashed hands of a person handling or preparing the food.

# Shiegella - Shiegellosis

- Shigellosis is an infectious disease caused by a group of bacteria called *Shigella* (shih-GEHL-uh).
- Most who are infected with *Shigella* develop diarrhea, fever, and stomach cramps starting a day or two after they are exposed to the bacteria.
- Shigellosis usually resolves in 5 to 7 days. Some people who are infected may have no symptoms at all, but may still pass the *Shigella* bacteria to others.
- The spread of *Shigella* can be stopped by frequent and careful handwashing with soap and taking other hygiene measures.

***Shigella*** is a genus of bacteria that is Gram-negative, facultative anaerobic, non-spore-forming, nonmotile, rod-shaped and genetically closely related to *E. coli*.

# Staphylococcal food poisoning

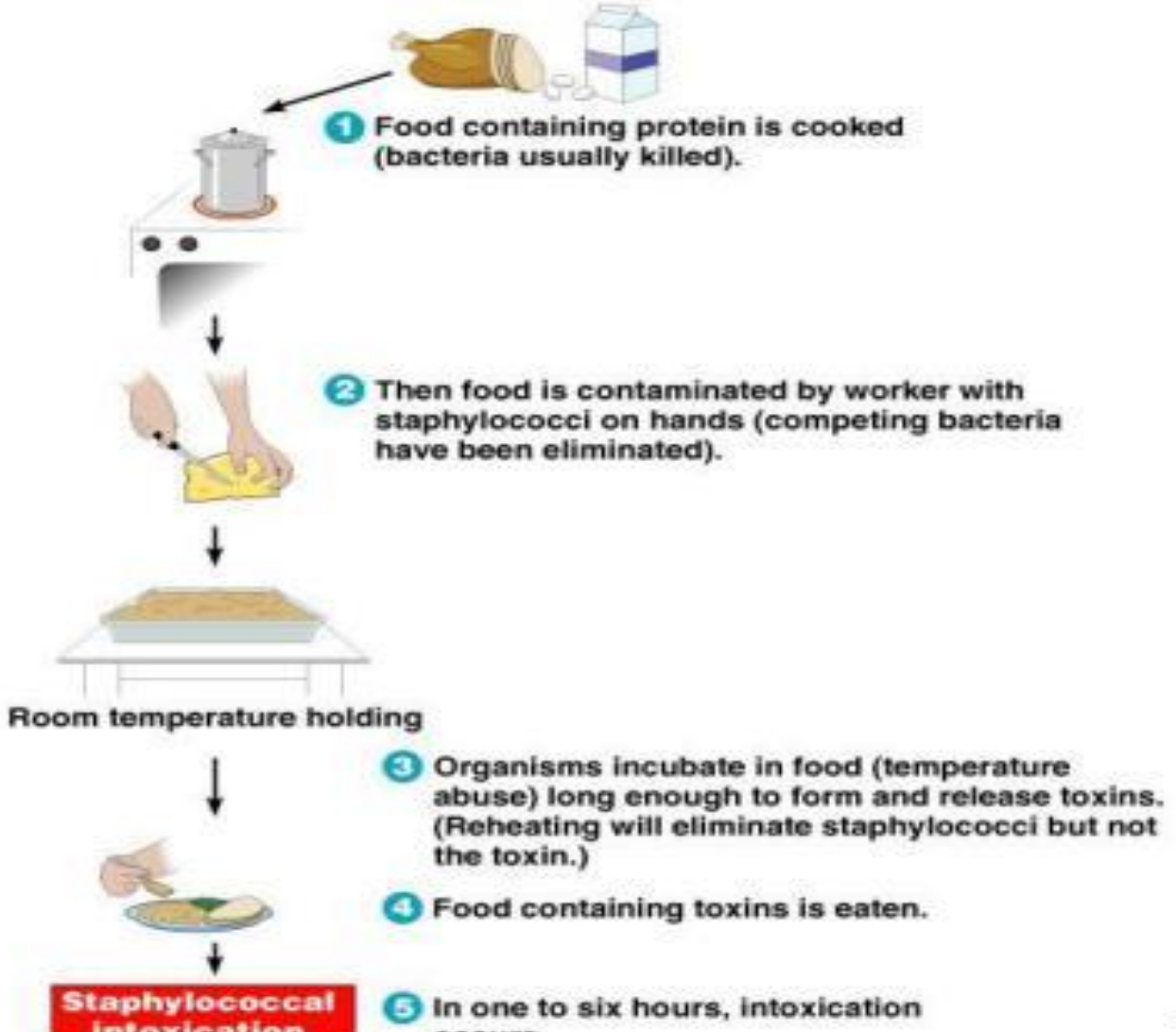
- Staphylococcal food poisoning is a gastrointestinal illness caused by eating foods contaminated with toxins produced by the bacterium Staphylococcus aureus (Staph). Staph is found on the skin and in the nose of about 25% of health.
- If left untreated, staph can get progressively worse by progressing into vital organs of the body and the bloodstream, becoming a potentially fatal problem. According to Physorg, "Staph infections can cause life-threatening skin infections, as well as infections in bones, joints, surgical wounds, heart valves and lungs, in people and animals.

# staph infection contagious to humans?

- Staph skin infections can become contagious if they are touched directly by someone else, or if the wound/opening comes into contact with surfaces and objects. As a general rule, invasive staph infections are not contagious because the bacteria target a specific location inside your body.

# Staphylococcal Food Poisoning

- *Staphylococcus aureus enterotoxin is a superantigen*
- *Diarrhea is not a typical feature of this kind of food poisoning*.



# 5) Staphylococcal Food Poisoning

- Caused when consuming food in which S.aureus has multiplied and formed endotoxin
- Symptoms:
  - Nausea
  - Vomiting
  - Severe abdominal cramp
  - Diarrhoea
  - Sweating
  - Headache,etc.

# Common Foods Implicated

Meat

Poultry

Tuna salad

Cream pastries

# *Staphylococcus aureus*

**Lab diagnosis:**

- Staphylococcal food poisoning can be diagnosed if they are isolated in large numbers from the food and their toxins demonstrated in the food. Dilutions of food may be plated on Mannitol Salt agar.
- Enterotoxin may be detected and identified by gel diffusion.

# Treatment

- The toxin is not affected by antibiotics, thus antibiotics are not useful.
- Plenty of rest, plenty of fluids and medications to calm the stomach are recommended.
- Those most at risk for severe illness such as young children, the elderly and individuals with a weakened immune system may require intravenous therapy and care in the hospital.

# Prevention

- *Staphylococcal* food intoxication can be prevented by practicing safe handling and proper storage of food, frequent hand washing with soap and water, keeping kitchens and food serving areas clean and sanitized, and educating food handlers in strict food hygiene.

# Campylobacter

- Campylobacter are germs (bacteria) that are a common cause of food poisoning.
- Typically, food poisoning causes gastroenteritis, an infection of the gut (intestines), leading to diarrhea and sometimes being sick (vomiting).
- *Campylobacter* can cause a gastrointestinal infection called campylobacteriasis.
- The incubation period is 24–72 hours after infection.
- This is characterized by an inflammatory, sometimes bloody diarrhea or dysentery syndrome, mostly including cramps, fever, and pain.

- The most common routes of transmission are fecal-oral, ingestion of contaminated food or water, and the eating of raw meat. Foods implicated in campylobacteria include raw or under-cooked poultry, raw dairy products, and contaminated produce.

# Escherichia coli (E. coli)

- Escherichia coli (E. coli) bacteria normally live in the intestines of healthy people and animals. Most varieties of E. coli are harmless or cause relatively brief diarrhea. But a few particularly nasty strains, such as E. coli O157:H7, can cause severe abdominal cramps, bloody diarrhea and vomiting.
- Exposure to E. coli from contaminated water or food — especially raw vegetables and undercooked ground beef. Healthy adults usually recover from infection with E. coli O157:H7 within a week, but young children and older adults have a greater risk of developing a life-threatening form of kidney failure called hemolytic uremic syndrome.

# Symptoms

- Signs and symptoms of E. coli O157:H7 infection typically begin three or four days after exposure to the bacteria, though you may become ill as soon as one day after to more than a week later. Signs and symptoms include:
- Diarrhea, which may range from mild and watery to severe and bloody
- Abdominal cramping, pain or tenderness
- Nausea and vomiting, in some people
- To reduce chance of being exposed to E. coli, avoid risky foods and watch out for cross-contamination.

# Botulism

- Botulism is caused by the bacterium *Clostridium botulinum* (*C. botulinum*). It releases a neurotoxin, which is a poison that attacks your nervous system.
- Botulism is usually linked with canning fruits and vegetables at home. Commercially canned foods can carry the bacteria that cause botulism, but that rarely happens these days.
- Incubation period 12-36 hr.

# symptoms of botulism poisoning include the following:

- Nausea, Vomiting, Fatigue, Dizziness, Double vision, Dry skin, mouth and throat
- Drooping eyelids
- Difficulty swallowing
- Slurred speech
- Muscle Weakness
- Body Aches
- Paralysis
- Lack of fever

# TREATMENT OF BOTULISM

- If found early, botulism can be treated with an antitoxin that blocks circulation of the toxin in the bloodstream. This prevents the patient's case from worsening, but recovery still takes several weeks.

# Clostridium.perfringens

- Source – faeces of human, animals soil, water and air.
- Incubation period – 6-24hr
- If meat and poultry not cooked properly.
- Symptoms are diarrhea, abdominal cramps, low grade fever or no fever. Nausea & vomiting are rare, recovery generally within a day.

# Food toxicants

- A **toxicant** is any toxic substance. Toxicants can be poisonous and they may be man-made or naturally occurring.
- In contrast, a toxin is a poison produced naturally by an organism (e.g. plant, animal, insect).The different types of toxicants can be found in the air, soil, water, or food.

- The classification are:

- 1. Naturally Occurring Toxicants

- 2. Toxicants from Microorganisms

- 3. Toxic Chemicals, Pesticides and Insecticides.

# 1. Naturally Occurring Toxicants:

i. **Lathyrism:**

a. This is a crippling disease accompanied by paralysis of the leg muscles occurring mostly in adults who consume large quantities of the seeds of L-sativus or other lathyrus species(khesari daal) for a long period.

b. The disease is found to occur in Bihar, Uttar Pradesh and Madhya Pradesh as well as Spain, Algeria, France and Italy.

c.Toxin BOAA is present in Laththyrus Sativus

# Symptoms:

- a. First of all weakness in the lower limbs with spasticity of leg muscles. As a result, the movement of the ankle and knee joints are restricted and painful.
- b. Flexion of the knee is prominent in the second stage and there is inversion of foot with a tendency to walk on toes.
- c. In the third stage, the above symptoms become more prominent and the individual can walk only with the help of sticks.
- d. In the fourth stage, the knee becomes completely flexed and walking becomes quite impossible. The thigh and leg muscles become atrophy.

# ii. Ackee Fruit Poisoning:

- 1. The ackee fruit is cultivated in Nigeria. This fruit is consumed after boiling for 15 to 20 minutes.
- b. The poisonous properties of the fruit are due to unusual amino acid, hypoglycin A, hypoglycin B. Both hypoglycin A and B have strong hypoglycemic action resulting in coma and death.
- c. The signs and symptoms of this fruit poisoning in young children are found that the children sometimes vomit and they show drowsiness, convulsions or coma. These symptoms are due to severe hypoglycemia. They are treated by intravenous glucose for recovery.

# iii. Goitrogens:

- a. Many food stuffs contain organic compounds which have goitrogenic properties.
- b. The active goitrogenic principle present in brassicae family in 1, 5-vinyl-2-thio- oxazolidone which is present in cabbage and turnip.
- c. Certain oilseeds namely rapeseed, mustard etc. contain thioglycosides which act as goitrogens.
- d. The red skin of groundnut contains phenolic glycosides which possess goitrogenic properties.

# iv. Pressure Amines:

- 1. A number of amines namely histamine, tyramine, serotonin and norepinephrine found in some foods have profound physiological activity. Most of them are inactivated by mono-amino oxidase in the intestinal tract. The poisoning effect of pressure amines due to consumption of aged cheese has been reported in patients receiving mono-amino oxidase inhibiting drugs.
- 2. The pressure amine foods are mainly plantains (green and ripe), juices of pineapple and tomato, banana, lemon etc.

# v. Argemone Seed Oil Poisoning:

- a. During the harvest of rapeseed, argemone seeds are mixed up with rapeseed which grow as weeds. The rapeseed oil obtained from a mixture of rapeseed and argemone seed causes epidemic dropsy in man.
- b. The toxic substance in argemone seed is sanguinarine.

# 2. Toxicants from Microorganisms:

- a. The harmful microorganisms contaminate the raw foods such as meat, fish, milk, etc. purchased from the market.
- b. These microorganisms are destroyed during cooking or processing but some of the microorganisms survive due to insufficient heat.
- c. Pathogenic fungus infects food-grains and oilseeds when stored in humid atmosphere causing serious illness.

- **Fungal Contamination:**
- Fungi, e.g., Aspergillus flavus, Penicillium islandicum, Fusariums, Claviceps purpurea (ergot) produce a good number of toxic compounds (myco-toxins).
- **Aspergillus flavus:**
- This fungus has been found to be grown in cotton seed, cereals, moist groundnut, and soya bean. It produces a toxic substance named as aflatoxins which can develop cancer and cirrhosis of the liver in experimental animals. The aflatoxin poisoning has recently been occurred in Rajasthan and Gujarat owing to consumption of maize highly contaminated with Aspergillus flavus.
- **Penicillium islandicum:**
- The yellow discolouration in rice has been reported in Japan by the contamination of rice by Penicillium islandieum during storage and develops toxic symptoms in man.

# Claviceps purpurea (Ergot):

- This parasitic fungus infects food grains such as rye and pear millet during cultivation. The disease ‘Ergotism’ occurs as a result of the consumption of the contaminated grain. The symptoms of this disease are nausea, vomiting, diarrhea, giddiness, severe burning sensation in the extremities, painful cramps in limbs, gangrene in the fingers and toes, depression, weakness and convulsions.
- The fungus produces the toxic alkaloids causing the disease.

# Fusarium and eladosporium:

- The millet is infected by this fungus when left un-harvested in the field during winter. The toxic compound formed by this fungus causes local inflammatory response, acute gastro-enteritis, nausea, and vomiting within 1 to 3 days after the consumption of the infected grain.
- The progressive pathological changes in the bone-marrow due to the toxin leads to leukopenia, agranulocytosis and anemia. There is also petechial hemorrhages followed by the development of necrotic ulcers of the skin. In less advanced cases, the recovery of the disease takes place, in case, the patient is put on a good diet with proper treatment.

- **Parasitic Infection:**
- The contaminated foods transmit some parasitic diseases, e.g., amoebiasis, ascariasis and hookworm, when raw vegetables grown on sewage are consumed.

## 3. Toxic Chemicals, Pesticides and Insecticides: Lead, mercury, arsenic, antimony, D.D.T., and B.H.C., etc. can contaminate foods due to the following reasons:

- i. The toxic chemicals such as barium carbonate, arsenic oxides, lead arsenate, etc. used as rat poisoning are accidentally mixed with food.
- ii. Accidental contamination of food with pesticides and insecticides.
- iii. Some toxic chemicals or minerals are also present in certain marine foods.
- iv. The presence of large amounts of certain food additives.

# Toxic Metals:

- The toxic element lead causes toxic symptoms after contamination with food, the pathological changes in the kidneys, liver, and arteries are brought about by lead. The common signs of lead poisoning are nausea, abdominal pain, anemia, muscular paralysis, and brain damage.
- The toxic effects of methyl mercury are neurological. When the brain is affected, the subject becomes blind, deaf, and paralysis of the various muscles makes him cripple. Cadmium, arsenic, antimony, cobalt, etc. are toxic in small doses.

- **Pesticides:**
- The organic pesticides are D.D.T., B.H.C., and malathion, etc. and these are the toxic compounds. The presence of large amounts of pesticides causes toxic effects.
- **Additives:**
- In U.S.A. and other western countries, the additives such as diethyl stilbesterol and antibiotics are added to animal and poultry feeds. These are present in the meat of animals fed on feeds containing these chemicals. Stilbesterol can cause leukemia and cancer even in small doses. Antibiotics can cause drug resistance and hardening of arteries.

# Food fortification

- Food fortification or enrichment is the process of adding micronutrients (essential trace elements and vitamins) to food. Sometimes it's a purely commercial choice to provide extra nutrients in a food, while other times it is a public health policy which aims to reduce the number of people with dietary deficiencies within a population.
- **examples of fortified foods?**
- Grain products (like bread and pasta) with folic acid.
- Milk fortified with vitamin D...
- Fortified orange juice with calcium...
- Eggs fortified with omega-3 fatty acids...
- A fortified diet is where meals are adapted by adding small quantities of everyday. foods, such as cream, butter, milk, and milk powder, which increases the calorie and. nutrient content without increasing portion size.

# Food adulteration

- Adulterated food. Adulteration is a legal term meaning that a food product fails to meet the legal standards. One form of adulteration is an addition of another substance to a food item in order to increase the quantity of the food item in raw form or prepared form, which may result in the loss of actual quality of food item.
- Adulterate means to make something inferior or less pure by adding something harmful or of a lower quality. An example of adulterate is when an organic beauty company adds harsh or harmful chemicals to their products.

# The main reasons for adulterating food products:

- Practiced as a part of the business strategy.
- An imitation of some other food substance.
- Lack of knowledge of proper food consumption.
- To increase the quantity of food production and sales.
- Increased food demand for a rapidly growing population.
- To make maximum profit from food items by fewer investments.

# Methods of Food Adulteration

- Here is a list of most common adulterants which have been added
- Adding certain chemicals for faster ripening of fruits.
- Mixing of decomposed fruits and vegetables with the good ones.
- Adding certain natural and chemical dyes to attract consumers.
- Mixing of clay, pebbles, stones, sand, and marble chips, to the grains, pulses and other crops.
- Cheaper and inferior substances are added wholly or partially with the good ones to increase the weight or nature of the product.

# LIST OF FOOD ADULTRANTS

## MILK

**ADULTERANTS**
- Unhygenic water
- Chalk powder
- Soap powder
- Hydrogen peroxide
- Urea

**HARMFUL EFFECTS**
- Food poisoning
- Heart problems
- Cancer
- Vomiting
- Nausea

## BLACK PEPPER

- Papaya seeds

- Liver disorders
- Stomach disorders

## OIL

- Argemone seeds

- Epidemic dropsy
- Severe glaucoma

## GHEE

- Vegetable oil
- Animal body fats

- Anaemia
- Enlargment of Heart

## CHILLY POWDER

- Brick powder
- Saw dust

- Stomach problems
- Artificial colors can cause cancer

## TURMERIC POWDER

- Yellow aniline dye
- Non-permitted colourants like metanil yellow

- Carcinogenic
- Stomach disorders

| Food Products | Adulterant | Harmful Effects |
|---|---|---|
| Milk and Curd | Water and starch powder. | Stomach disorders. |
| Ghee, Cheese and Butter | Mashed potatoes, Vanaspati and starch powder. | Gastro-intestinal disturbances and other stomach disorders. |
| Grains | Dust, Pebbles, Stones, Straw, weed seeds, damaged grain, etc. | Liver disorders, Toxicity in the body, etc. |
| Pulses | Dyes, chemical and Lead Chromate. | Stomach disorders. |
| Coffee powder | Chicory, tamarind seeds powder. | Diarrhoea. |
| Tea | Artificial colouring agents. | Liver disorders. |
| Sugar | Chalk powder, Washing soda, Urea, etc. | Stomach disorders and kidney failure. |
| Pepper | Dried papaya seeds and blackberries. | Severe allergic reactions including stomach and skin irritations. |
| Mustard seeds | Argemone seeds | Abdominal contractions, sluggishness and increased |

| | | |
|---|---|---|
| Edible Oils | Mineral oil, Karanja oil, castor oil, and artificial colours. | Gallbladder cancer, allergies, paralysis, cardiac arrest, and increased LDL cholesterol. |
| Turmeric Powder | Pesticide residues, sawdust, chalk dust, industrial dyes,metanil yellow dye arsenic, lead metal etc. | Cancer and Stomach disorders. |
| Chilli and Coriander powder | Redbrick powder, Rhodamine B dye, Red lead, dung powder, soluble salts, water-soluble synthetic colours and other common salts. | Metal toxicity, Cancer, lead poisoning, tumour, variations in blood pressure and other stomach related disorders. |
| Cinnamon sticks | Cassia bark. | Liver Damage, Low Blood Sugar, Mouth Sores and increased risk of cancer. |
| Cumin seeds | Coloured grass seeds, sawdust and charcoal dust | Stomach disorders. |
| Jam, Juice and Candies | Non-permitted dyes including metanil yellow and other artificial food dyes. | These dyes are highly carcinogenic that have the potential to cause different types of cancer. |
| Jaggery | Washing soda, chalk powder | vomitings and other Stomach disorders |

| | | |
|---|---|---|
| Honey | Molasses, dextrose, sugar and corn syrups | Stomach disorders |
| Fruits and Vegetables | Chemical dyes, Malachite green, calcium carbide, copper sulphate and oxytocin saccharin wax. | Stomach disorders, vomiting, and dyes used are highly carcinogenic. |
| Tomato sauces | Pumpkin pulp, non-edible artificial colours, and flavors. | Gastritis and inflammation of vital organs. |
| Ice Cream | Pepper oil, ethyl acetate, butyraldehyde, nitrate, washing powder. The kind of gum is added which is prepared by boiling different animal parts including the tail, udder, nose, etc. | Dreadful diseases that affect organs including lungs, kidneys, and heart. |

- Here are certain safety tips to avoid Adulteration
- Avoid dark coloured, junk and other processed foods.
- Make sure to clean and store all the grains, pulses and other food products.
- Wash fruits and vegetables thoroughly in running water before it is used.
- Check the seal is valid or not, before buying the food products like milk, oil, and other pouches.
- Always make sure to check and buy products having an FSSAI-validated label, along with the license number, list of ingredients, manufactured date, and its expiration.

# Control of food adulteration

- AGMARK(Agricultura marketing)
- BIS(Bureau of Indian Standards)
- FPO(Food processing industries)
- Rules
- Food adulteration act
- Food safety and standards authority of India
- National Biotechnology Standards

# Effects of intoxicating drugs on the body

- **Intoxicating drugs**
- Intoxicating drugs are not always illegal or prohibited by the law (mainly because in most cases, they do not induce addiction, or it has not been established that they do..).
- The commonest intoxicant is alcohol but there are also natural intoxicating plants and chemical intoxicating substances.

# classification

any route of administration perception
or brain functioning .

**Drug abuse**– Use of mind altering substance in a diffent way from generally approved medical or social practices.

**Dependence**– Habituation or compulsive use is psychological or physical need for the drug.

**Tolerance**– Toleration of higher and higher doses of the drug or requirement of higher and higher amount of drug to produce the same effect due to alteration in drug metabolism, where in liver destroys the substance more quickly.

Appearance of physiological symptoms, when drug is stopped suddenly, is with drawal effect.

**Classification**

| *Class* | *Example* |
|---|---|
| General CNS depressant | Alcohol, hypnotics, antianxiety drugs |
| CNS sympathomematic or stimulants | Amphetamine, methyl phenidate, cocaine, weightloss product |
| Opiates | Heroin, morphine, methadone propoxyphene |
| Cannabinoids | Marijuana, Hashish. |
| Psychotics, hallucinogens | LSD, mescaline psilosybine |
| Solvents | Aerosol, sprays, glue, toluene, gasoline, paint thinner. |
| Over the counter drug | contain atropine, scorpolamine antihistamine |
| Other | Phencyclidine, bromide. |

| Drugs | Medical usage | Therapeutic doses | Action | Effects on body |
|---|---|---|---|---|
| 1. Amphetamine & synthetic drugs | Obesity, mild depression,narcolepsy, certian behavior disorder in children | 10-30mg /day | CNS | Mood elevation, elation, feeling of well being, increas alertness & sense of hightened awareness, increases s confidence, energy & endurance power |
| 2. Cocaine | Potential local anaesthetic, CNS stimulant | – | CNS Stimulant | Sense of excitement, hightened & distorted awarene & hallucination. Produces no dependence or no with drawal symptoms |
| 3. Barbiturates | Major ingredient in sleeping pills | – | sedate | Act as sedatives. Drug users prefer short acting barbi turate such as pentobarbital, secobarbital to long acting ones. Leads to increasing both physical & psychologi cal dependence & worst suffering. |
| 4. Cannabis exudate of flowers of female plant-Hashish. Dried leaves & flowering shoots-Bhang, small leaves & brackets infl-ouroscence Ganja All parts of plants is called marijuana | – | – | – | Dreamy state,altered conciousness,relaxation, euphoria, increased tendency to laugh, greater awareness of colours & space. There is psychic dependence. |

| Drugs | Medical usage doses | Therap-eutic | Action | Effects on body |
|---|---|---|---|---|
| 5. Heroin | Narcotic analgesic | – | Anal-gesic | worst types of addiction, as it produces craving. Develops psychotic dependence very fast. tolerance develops very fast leading to increase in doses to have desired effect. |
| 6. Caffeine Most common drink | – | – | CNS stimu-lant | Anxiety, agitation, restlessness, insomnia, head ache & somatic complaints similar to heart & gastrointestinal tract. With drawal may lead to headache irritability, lethargy & occassional nausea. |

# What Is Substance Abuse?

- Substance abuse is when you take drugs that are not legal. It's also when you use alcohol, prescription medicine, and other legal substances too much or in the wrong way.
- Substance abuse differs from addiction. Many people with substance abuse problems are able to quit or can change their unhealthy behavior. Addiction, on the other hand, is a disease. It means you can't stop using even when your condition causes you harm.

- **Commonly Abused Drugs**
- Both legal and illegal drugs have chemicals that can change how your body and mind work. They can give you a pleasurable "high," ease your stress, or help you avoid problems in your life.

# Alcohol

- Alcohol affects everyone differently. But if you drink too much and too often, your chance of an injury or accident goes up. Heavy drinking also can cause liver and other health problems or lead to a more serious alcohol disorder.
  If you're a man and you drink more than four drinks on any day or more than 14 in a week, you're drinking too much. For women, heavy drinking means more than three drinks in one day or more than seven drinks a week.
- One drink is:
- 12 ounces of regular beer
- 8-9 ounces of malt liquor, which has more alcohol than beer
- 5 ounces of wine
- 1 1/2 ounces of distilled spirits like vodka and whiskey

# Alcoholism (Madatyaya)

- **Nidana.**
- Alcoholic intoxication is of four kinds, Vata, Pitta and Kapha and Sannipatika. All varieties of intoxication arise from all the doshas (together undergoing increase) but the naming (of each kind as vataja etc.) Is based on the predominance.
- The general (common) symptoms of them are profound delusion, discomfort in the region of the heart, diarrhoea, constant thirst, mild or severe fever, loss of taste and appetite, pain in the head, flanks and bones, tremors, cutting pain in the vital spots,catching pain in the upper back and constriction in the chest, blindness or coma, cough, swelling, disorders of the mind, irrelevant talk, vomiting, nausea, dizziness and seeing bad dreams

# Treatment

- when all the doshas are found to be equal in alcoholism; then treatment should be to the seats of kapha first, because alcoholism generally has aggravation of pitta and vata at its terminal stages.
- Treatment. Kapha predominant treatment: vaman (vomiting) with salt water (saindhava-rock salt) or yasti madhu (liquorice) water decoction, boil down from 8 cups to one. Madhavapala, limejuice taken with warm water. Emaciated patient should not be treated with vaman therapy.
- Pitta is increased. Pachaka pitta has been vitiated by excess vata, therefore pachaka pitta has to be strengthened by agni deepana therapy, use trikatu with honey
- Correct vata. Basti therapy (medicated enema) to correct vata, also use purgatives (mild purgatives for weaker patients).
- Oleation treatment with sesame oil, narayana oil, panchtikta ghrita, brahmi ghrita.
- Rasayana to correct ojas, aswaghanda rasayana etc.
- Arista’s and asavas (medicated wines) can be used.
- Nidana parivajanam (prevention of causes). I.e. prevent loneliness etc.