

***Waste disposal
and
Health***

Learning Objectives

1. Define solid waste
2. Describe the process of SWM
3. Describe methods of disposal
4. Define sanitation barrier
5. Describe soakage pit

- Disposal of wastes:
 - Largely the domain of sanitarians and public health engineers
 - Health professionals need to have basic knowledge

Solid waste, if allowed to accumulate, is a health hazard, because:

1. Decomposes and favours fly breeding
2. Attracts rodents and vermin
3. Pathogens present may be conveyed back through fly and dust
4. Possibility of water and soil pollution
5. Heaps of refuse: unsightly appearance and nuisance from bad odours

- Therefore, in all civilized countries, there is an efficient system for its collection, removal and final disposal ***without risk to health...***

Solid wastes: definitions

- Garbage (food wastes)
- Rubbish (paper, plastics, wood, metal, throw-away containers, glass, etc)
- Demolition products (bricks, masonry, pipes)
- Dead animals
- Manure
- Sewage treatment residue (sludge and solids from the coarse screening of the domestic sewage)
- Other discarded material
- It should not contain night soil

- Sources of Refuse:

- Street- leaves, straw, paper, animal droppings etc.
- Market- putrid vegetable and animal matter
- Stable- animal dropping & left over animal feed
- Industrial
- Domestic: ash, rubbish, garbage
 - Ash- Residue from fire used for cooking & heating.
 - Rubbish- paper, clothing, bits of wood, metal, glass, dust & dirt.
 - Garbage- waste food, vegetable peeling etc.

- Storage:
 - Galvanized steel dustbin
 - Paper sack
 - Public bins
- Collection:
 - House to house
 - Indiscriminate
 - Army of sweepers
 - Public bin to the ultimate site; open refuse carts
 - Dead animals: direct transport to the place of disposal
 - Mechanical dustless refuse collector

- Methods of disposal: no single method;
(Choice depends on:)
 - Cost
 - Availability of land and labour
 1. Dumping
 2. Controlled tipping
 3. Incineration
 4. Composting
 5. Manure pits: rural, individual household level
 6. Burial: small camps

1. Dumping:

- low lying areas
- Reclamation of land
- easy method
- Drawbacks:-
 - Refuse is exposed to flies & rodents
 - Source of nuisance from the smell & unsightly appearance
 - Pollution of surface & ground water.

Controlled tipping / sanitary landfill

- Trench, ramp and area method
- waste covered with earth at the end of the day
- modified sanitary landfill (once / twice a week)
- Physical, chemical and bacteriological changes occurs, temperature rises up to 60 deg in 7 days, pathogens killed, then it takes 2-3 weeks to cool down.
- 4 – 6 months: process of complete decomposition
- Newer method- mechanization by bulldozer

Composting:

- Combined disposal of refuse and night soil/ sludge
 - A process of nature whereby organic matter breaks down under bacterial action resulting in the formation of relatively stable humus like material called the ***compost***
 - Principal by products: CO₂, H₂O and heat
 - End product: almost free of organisms
 - Two methods:
 - Bangalore method (anaerobic)
 - Mechanical composting (aerobic)
- Not recommended for bigger populations

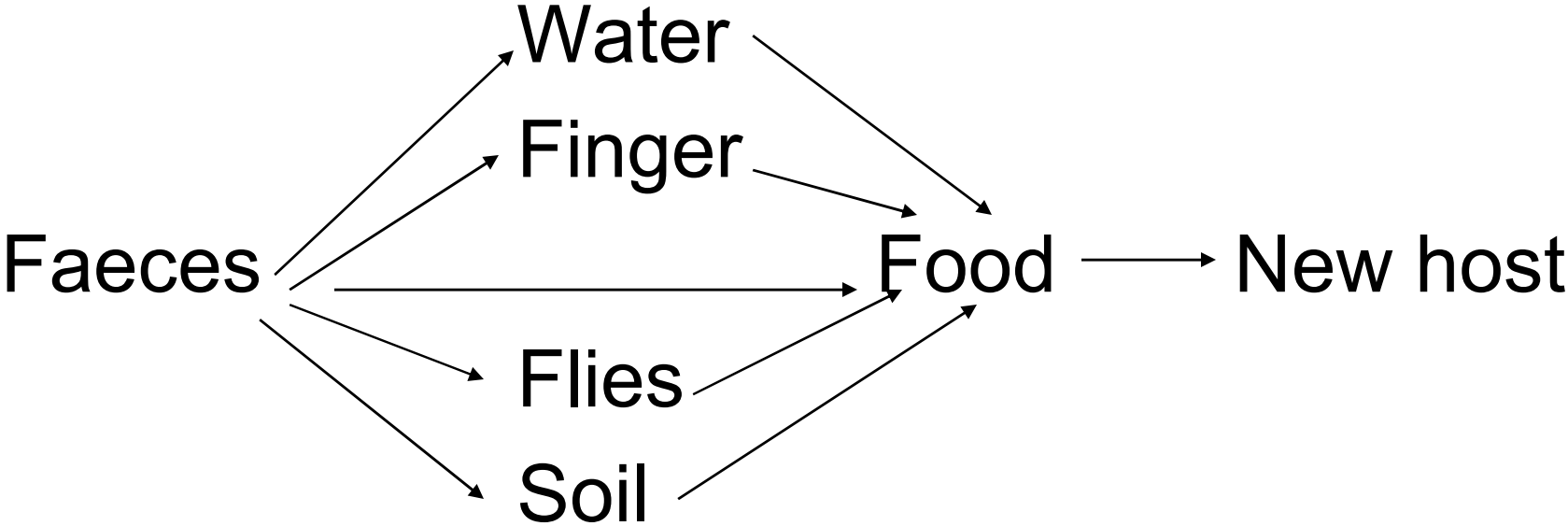
Other Methods are: -

- Manure Pits
- Burial

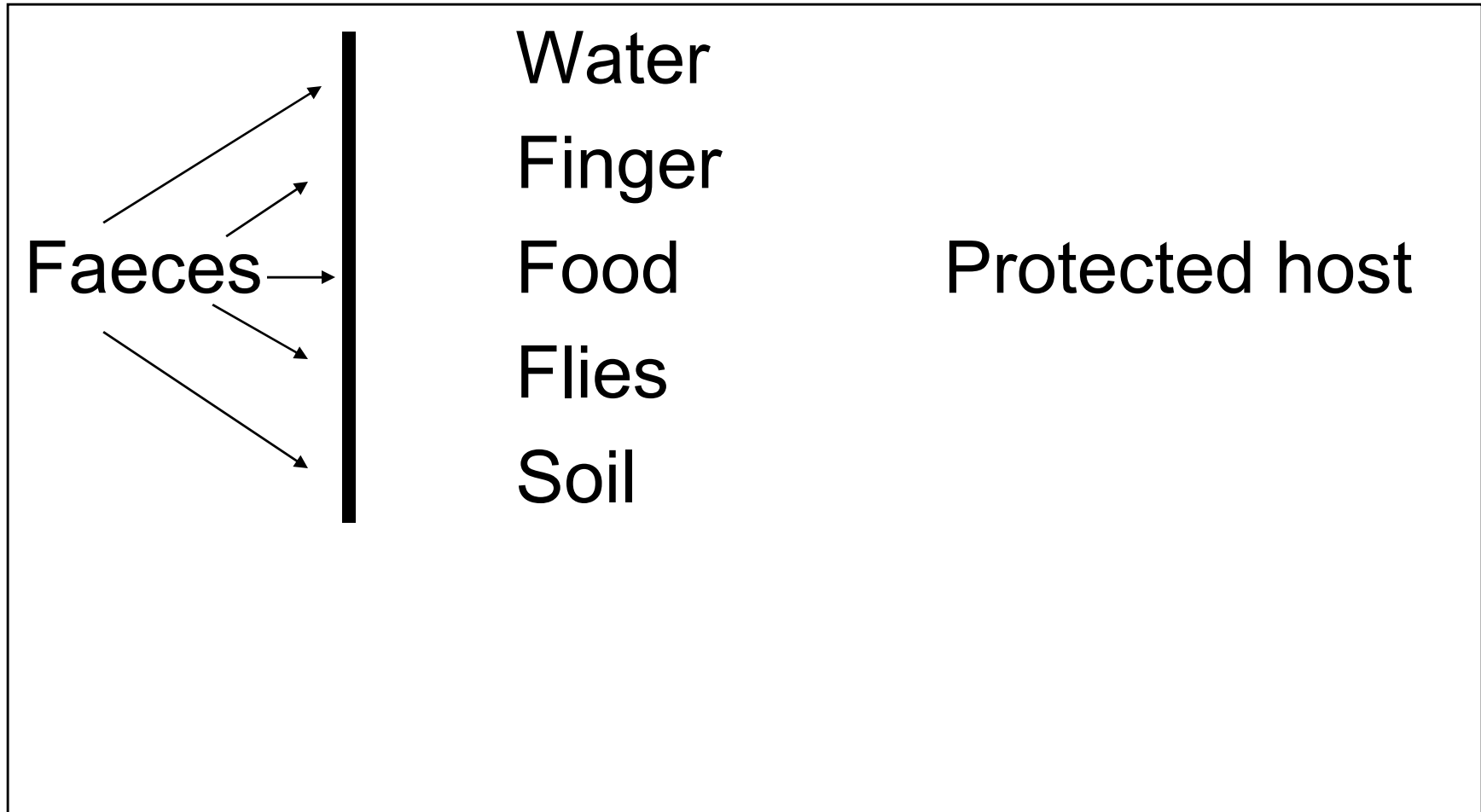
Other Measures

- Public education
- Legislation (latest: mobile courts in the city)
- Economics and finance
- International cooperation:
 - International solid waste and public cleansing association (ISWA)
 - WHO international reference centre

How disease is transmitted to the individual from excreta



Sanitary barrier



- **Disposal of liquid waste:**

- Waste water from kitchen and bathrooms: sullage
- Industrial waste
- Human and animal urine

Hazards:

- Mosquito breeding
- Increased humidity
- Fly and cockroach nuisance
- Pollution of water
- Water logging: lowers the quality of soil

- Where facilities are available, the sullage is disposed in septic tanks, under ground sewerage system or road drains
- Kitchen gardens may also be developed
- Soakage pits in rural areas and small towns

Soakage pit

- Sullage contains fatty substances
- Likely to interfere with the functioning of the soakage pit, during cooler months, especially in cold climates
- Installment of a grease trap made of tin containing straw and grass (not required in hot climates as fats do not solidify)
- Needs to be replaced periodically

- Pit is dug at a strategic point in the courtyard wherein sullage from bathroom and kitchen can be admitted
- Pit from bottom to top is filled with large stones and brick bats and gravel, the largest size at bottom most layer and gradually smaller size as layers are laid towards top
- Topmost layer is of gravel or sand
- Pit is covered by a bamboo matting

- Mechanism:

- The sullage gets surface for attachment around the stones, gravel, etc where,

1. biological degradation of water takes place

2. while straining through, mechanical filtration

3. water gets larger surface for evaporation

4. water percolates in the ground

- ***5th June: World Environment Day***

- Theme for 2009:

“Your planet needs you: unite to combat climate change”

- Theme for 2010:

“Many species; one planet; one future”

- This year, the United Nations Environment Programme (UNEP) has selected India as host of World Environment Day 2011. The Environment Day 2011 slogan is 'Forest: Nature at your service'. Forests cover 1/3 of the earth's land mass and play a key role in our battle against climate change, and releasing oxygen into the atmosphere while storing carbon dioxide – this is what the theme aims to reinforce.

WORLD ENVIRONMENT DAY



5 JUNE

Forests: Nature at Your Service

In support of the UN International Year of Forests