Sources of microorganisms in foods

Foods are not sterile
- Natural microbiota
- Composed by microorganisms gaining entrance during normal production-processing operations
- Natural microflora may include spoilers that will have an effect if environmental conditions are favorable for growth

This means that there are microorganisms in the environment.

Sources of microorganisms in fresh meats
- Presence of microorganisms in and on the live animal
- External surfaces:
  - Hide
  - Hair
  - Hooves, horns
- Gastrointestinal tract
Sources of microorganisms in fresh meats

- Presence of microorganism on the carcass
  - Exterior surfaces
  - Contamination during dehiding
  - Gastrointestinal contents
  - Equipment and utensils
  - Workers (clothes, hands)
  - Air
  - Water
  - Additives
  - Packaging materials

Sources of microorganisms in fresh fruits and vegetables

- Soil
- Water
- Fertilizers
- Dust

Sources of pathogens in fresh produce

Pre harvest

- Feces
- Soil
- Water
  - Irrigation
  - Solvent
- Non-fermented manure

- Air (dust)
- Animals
  - Wild
  - Domestic
- Insects
- Humans

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Sources of pathogens in fresh produce

**Post harvest**
- Feces
- Humans
- Harvesting equipment and utensils
- Transporting vehicles
- Animals
  - Wild
  - Domestic
  - Insects
- Air (dust)
- Water (washing)

**Cross contamination**
- Transfer of microorganisms from a contaminated surface or material to a non-contaminated food or surface

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