



Importance of fruit and vegetables for public health and food safety

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**World Health
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Noncommunicable Disease (NCD) crisis in the Pacific





Once these foods dominated the diet



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They have now been substituted by these



Primary indicators of an unhealthy diet

- Oversupply of calories (kilojoules)
 - Too much food, leading to high total energy intakes
- Imbalance in macronutrients
 - Too much fat and/or sugar and insufficient dietary fibre
- Excessive intake of salt
- Low intake of micronutrient
 - Low intake of fresh fruits and vegetables



Why focus on fruits and vegetables?

- Low fruits and vegetable intake is among the top 10 risk factors for attributable mortality
- About 2.7 million deaths could be saved with adequate fruit and vegetable consumption
- Fruit and vegetable consumption helps reduce the risk of NCDs



What NCDs can be prevented?

- Adequate intake of fruits and vegetables as part of the daily diet helps prevent
 - Cardiovascular disease
 - Certain types of cancer
- Fruits and vegetables are also associated with reduced risk of obesity and diabetes.
- Micronutrient deficiencies
 - Birth defects
 - Weakened immune system



What is the recommended daily intake of fruits and vegetables?

400 grams

5 servings

Fruits and vegetables:

- An important source of micronutrients and dietary fibres
- Can help displace foods high in fat, sugars and salt



Percentage of who eat less than 5 servings per day in the Pacific

Country	Male	Female
Vanuatu	58.2%	65%
Fiji	83.9%	86.2%
Tonga	92.3%	93.2%
Kiribati	99.4%	99.6%
Samoa	38.6%	36.8%
Cook Islands	83.5%	79.9%
Niue	94%	91.9%
Tuvalu	n.a.	n.a.
Marshall Islands	91.9%	90.1%
Palau	n.a.	n.a.



Challenges for increasing consumption

- Supply chain issues
 - Local production
 - Imports
- Convenience
- Social and cultural issues
- Price structures
- Awareness of health benefits



Fruits and vegetables have multiple health benefits

- **RED**

Can help reduce the risk of cancer and keep your heart healthy

- **PURPLE /BLUE**

Antioxidant properties that protect cells from damage and can help reduce the risk of cancer, stroke and heart disease.

- **ORANGE/YELLOW**

Carotenoids helps maintain healthy eyes



Colour is the key to nutrition

- **GREEN**

Contain a range of phytochemicals which have anti-cancer properties. Leafy greens such as spinach and broccoli are also excellent sources of folate

- **BROWN/WHITE**

Contain a range of health-promoting phytochemicals which are known for its antiviral and antibacterial properties. Some brown/white varieties are also a good source of potassium.



Fruits and vegetables colour chart

Red

Tomato
Red capsicum
Radishes
Strawberries
Cherries
Red grapes
Raspberries
Watermelon
Red apples

Purple/Blue

Beetroot
Red cabbage
Eggplant
Blackberries
Blueberries
Purple grapes
Plums

Orange/Yellow Green

Carrots
Lemons
Sweet potato
Pumpkin
Pineapples
Mangoes
Corn
Oranges
Squash
Peaches
Nectarines
Apricots
Grapefruit

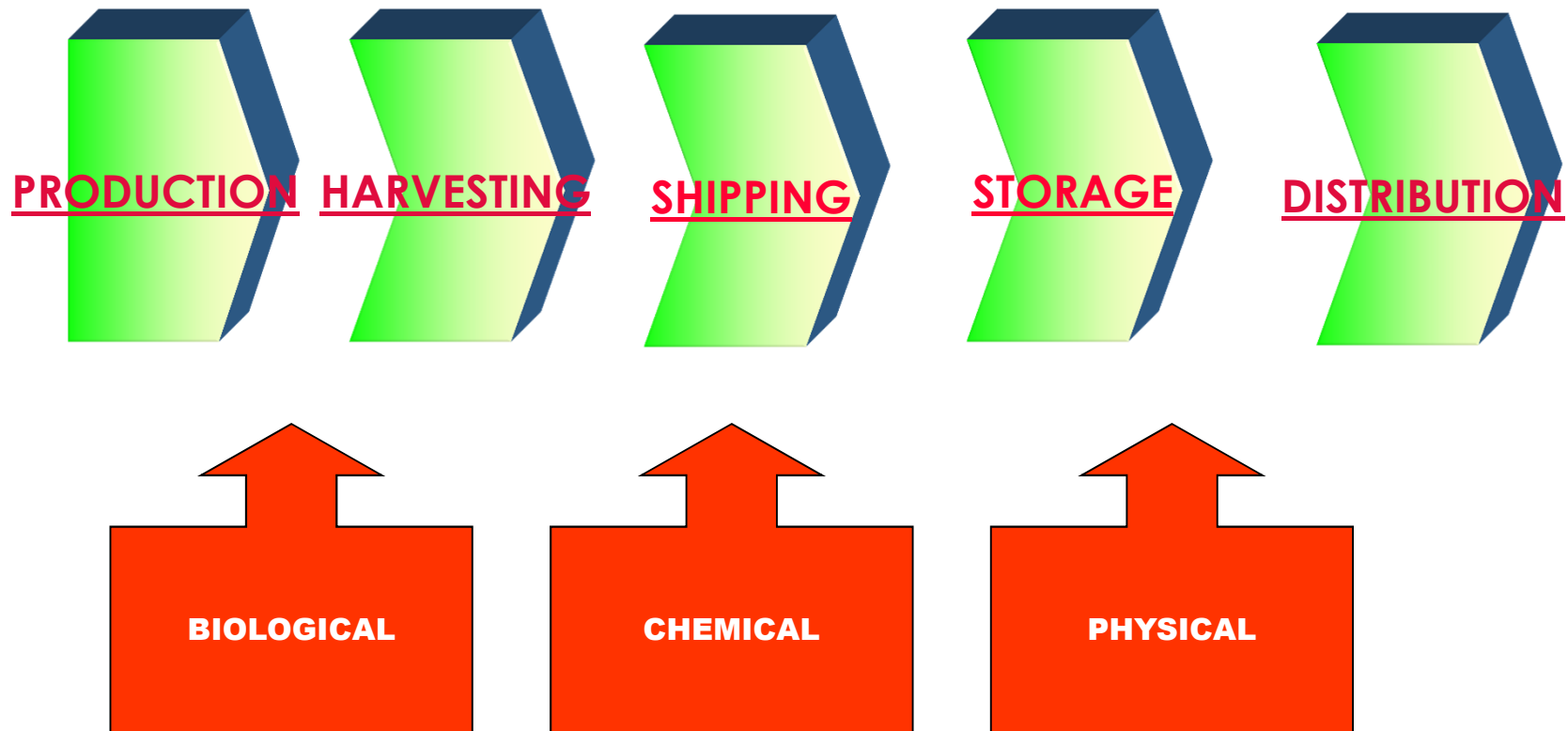
Spinach
Asparagus
Avocados
Broccoli
Peas
Green apples
Green grapes
Limes
Kiwifruit
Green beans
Lettuce
Cabbage
Cucumber
Green capsicum

Brown/White

Cauliflower
Brown pears
Mushrooms
White peaches
Garlic
Bananas
Potatoes
Dates
Onions
Ginger



Food safety issues associated with fruits and vegetables



Why is food safety an issue for fresh fruits and vegetables?

- Often consumed as fresh products
- No treatment for microbiological contamination.
- Large quantities of imports from many different countries
- Potential (over)use of (un)approved pesticides
- Natural toxins



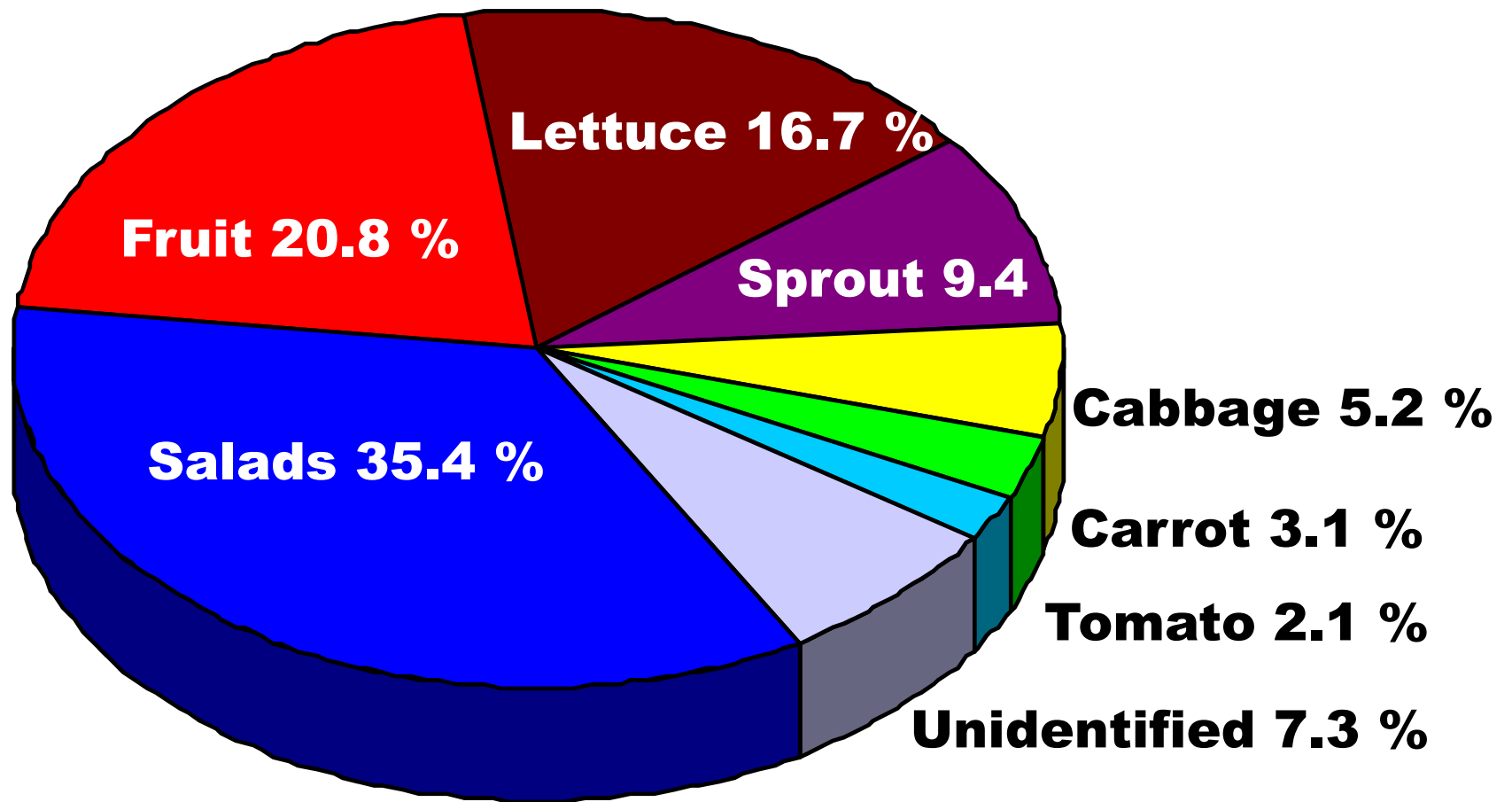
Recent foodborne disease outbreaks have been associated with fruits and vegetables

- Beansprouts E-Coli 0104:H4 (Germany, 2011) 50 deaths and 3,167 infected
- Dole Baby Spinach E-Coli (USA, 2006) 3 deaths, 31 kidney failure, 199 infected



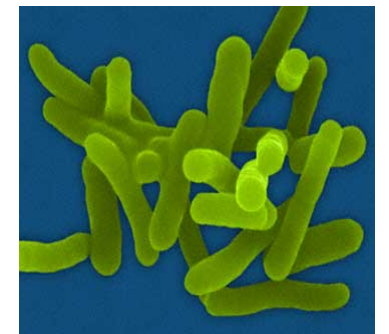
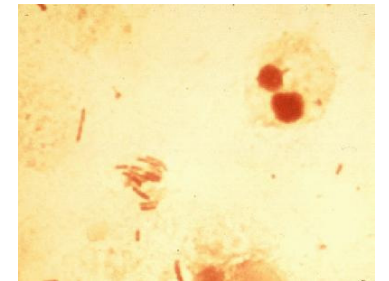
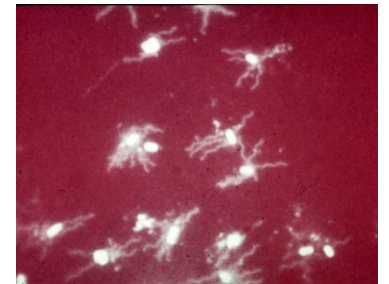
FRESH PRODUCE ASSOCIATED WITH FOOD BORNE DISEASES

USA: 1990-1998



Microbiological food safety hazards

- Can be found almost everywhere
- Able to survive for prolonged periods
- Impact the quality and safety of products
 - Spoilage
 - Flavour
 - Texture and appearance
- Health effects on consumers
 - Infection
 - Intoxication



Pathogenic microorganisms can cause

Infections

- Salmonella
- E-Coli
- Yersinia
- Vibrio
- Campylobacter

Intoxications

- Clostridium botulinum
- Staphylococcus aureus
- Bacillus cereus
- Toxigenic fungi



Common ways of contamination

- Soil
- Water
- Unhygienic handling
- Manure
- Sewage
- Air
- Animals



Chemical hazards are also very important

- Chemical residues have adverse effects on human health in the long run
- Can cause cancer and birth defects and damage or interfere with the nervous, reproductive and immune systems.
- Direct and indirect effect on environment and livestock



Chemicals can be added or being naturally present

Naturally present

- Allergens
- Mycotoxins
- Alkaloids
- Enzyme inhibitors

Intentionally added

- Fertilizers
- Pesticides
- Growth regulators
- Waxes
- Polluted irrigation water (heavy metals)



Ensuring food quality and safety is a shared responsibility

Producers and farmers



Government

Consumers



Government responsibility

- Enforcement of national rules and regulations
- Inspect imported fresh produce
- Ensure coordination between ministries
- Ensure availability at a reasonable price
- Raise awareness of food chain actors and consumers of the importance of consuming fruits and vegetables and ensuring food safety



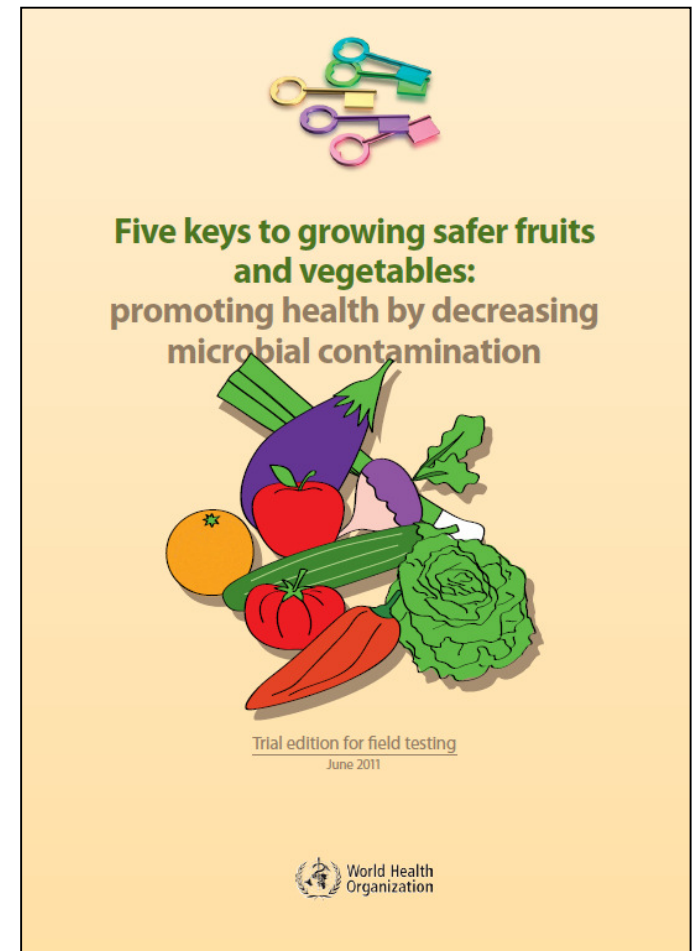
Farmers, producers and exporters etc.

- Supply safe and wholesome products
- Comply with standards and regulations
- Use good practices and manage food safety risks
- Inform consumers about product characteristics



Five keys practices

1. Practice good personal hygiene
2. Use safe water for irrigation
3. Protect fields from faecal contamination by animals, including birds
4. Use treated manure and treated faecal waste
5. Keep harvest equipment, containers and storage facilities clean and dry



Consumer responsibilities

- Perform safe practices in homes
- Demand safe products of reasonable quality and price
- Ensure that fruits and vegetables are part of their daily diet
- Consider establishment of home gardens



Conclusion

- Fruits and vegetables play an important role in the prevention of NCDs
- Intake of fruits and vegetables in the Pacific is low
- Measures need to be put in place to promote local production and increased consumption of fruits and vegetables
- Food safety assurance is key for expanding production and consumption

