

Annex

Summary of the strength of evidence for obesity, type 2 diabetes, cardiovascular disease (CVD), cancer, dental disease and osteoporosis^a

	Obesity	Type 2 diabetes	CVD	Cancer	Dental disease	Osteoporosis
Energy and fats						
High intake of energy-dense foods	C↑					
Saturated fatty acids		P↑	C↑ ^b			
Trans fatty acids			C↑			
Dietary cholesterol			P↑			
Myristic and palmitic acid			C↑			
Linoleic acid			C↓			
Fish and fish oils (EPA and DHA)			C↓			
Plant sterols and stanols			P↓			
α-Linolenic acid			P↓			
Oleic acid			P↓			
Stearic acid			P-NR			
Nuts (unsalted)			P↓			
Carbohydrate						
High intake of NSP (dietary fibre)	C↓	P↓	P↓			
Free sugars (frequency and amount)					C↑ ^c	
Sugar-free chewing gum					P↓ ^c	
Starch ^d					C-NR	
Wholegrain cereals			P↓			
Vitamins						
Vitamin C deficiency					C↑ ^e	
Vitamin D					C↓ ^f	C↓ ^g
Vitamin E supplements			C-NR			
Folate			P↓			
Minerals						
High sodium intake			C↑			
Salt-preserved foods and salt				P↑ ^h		
Potassium			C↓			
Calcium						C↓ ^g
Fluoride, local					C↓ ^c	
Fluoride, systemic					C↓ ^c	P-NR ^g
Fluoride, excess					C↑ ^f	
Hypocalcaemia					P↑ ^f	
Meat and fish						
Preserved meat				P↑ ⁱ		
Chinese-style salted fish				C↑ ^j		

	Obesity	Type 2 diabetes	CVD	Cancer	Dental disease	Osteoporosis
Fruits (including berries) and vegetables						
Fruits (including berries) and vegetables	C↓ ^k	P↓ ^k	C↓	P↓ ^l		
Whole fresh fruits					P-NR ^c	
Beverages, non-alcoholic						
Sugars-sweetened soft drinks and fruit juices	P↑				P↑ ^m	
Very hot (thermally) drinks (and food)				P↑ ⁿ		
Unfiltered boiled coffee			P↑			
Beverages, alcoholic						
High alcohol intake			C↑ ^o	C↑ ^p		C↑ ^g
Low to moderate alcohol intake			C↓ ^q			
Other food-borne						
Aflatoxins				C↑ ^r		
Weight and physical activity						
Abdominal obesity		C↑				
Overweight and obesity		C↑	C↑	C↑ ^s		
Voluntary weight loss in overweight and obese people		C↓				
Low body weight						C↑ ^g
Physical activity, regular	C↓	C↓	C↓	C↓ ⁱ P↓ ^t		C↓ ^g
Physical inactivity/sedentary lifestyle	C↑	C↑				
Other factors						
Exclusive breastfeeding	P↓					
Maternal diabetes		C↑				
Intrauterine growth retardation		P↑				
Good oral hygiene/absence of plaque					C↓ ^e	
Hard cheese					P↓ ^c	
Environmental variables						
Home and school environments that support healthy food choices for children	P↓					
Heavy marketing of energy-dense foods, and fast-food outlets	P↑					
Adverse socioeconomic conditions	P↑					

C↑: Convincing increasing risk; C↓: Convincing decreasing risk; C-NR: Convincing, no relationship; P↑: Probable increasing risk; P↓: Probable decreasing risk; P-NR: Probable, no relationship; EPA: eicosapentaenoic acid; DHA: docosahexaenoic acid; NSP: non-starch polysaccharides.

- ^a Only convincing (C) and probable (P) evidence are included in this summary table.
- ^b Evidence also summarized for selected specific fatty acids, see myristic and palmitic acid.
- ^c For dental caries.
- ^d Includes cooked and raw starch foods, such as rice, potatoes and bread. Excludes cakes, biscuits and snacks with added sugar.
- ^e For periodontal disease.
- ^f For enamel developmental defects.
- ^g In populations with high fracture incidence only; applies to men and women more than 50–60 years old.
- ^h For stomach cancer.
- ⁱ For colorectal cancer.
- ^j For nasopharyngeal cancer.
- ^k Based on the contributions of fruits and vegetables to non-starch polysaccharides.
- ^l For cancer of the oral cavity, oesophagus, stomach and colorectum.
- ^m For dental erosion.
- ⁿ For cancer of the oral cavity, pharynx and oesophagus.
- ^o For stroke.
- ^p For cancer of the oral cavity, pharynx, larynx, oesophagus, liver and breast.
- ^q For coronary heart disease.
- ^r For liver cancer.
- ^s For cancer of the oesophagus, colorectum, breast (in postmenopausal women), endometrium and kidney.
- ^t For breast cancer.

Shifting dietary patterns, a decline in energy expenditure associated with a sedentary lifestyle, an ageing population - together with tobacco use and alcohol consumption - are major risk factors for noncommunicable diseases and pose an increasing challenge to public health.

This report of a Joint WHO/FAO Expert Consultation reviews the evidence on the effects of diet and nutrition on chronic diseases and makes recommendations for public health policies and strategies that encompass societal, behavioural and ecological dimensions. Although the primary aim of the Consultation was to set targets related to diet and nutrition, the importance of physical activity was also emphasized.

The Consultation considered diet in the context of the macro-economic implications of public health recommendations on agriculture and the global supply and demand for fresh and processed foodstuffs. In setting out ways to decrease the burden of chronic diseases such as obesity, type 2 diabetes, cardiovascular diseases (including hypertension and stroke), cancer, dental diseases and osteoporosis, this report proposes that nutrition should be placed at the forefront of public health policies and programmes.

This report will be of interest to policy-makers and public health professionals alike, in a wide range of disciplines including nutrition, general medicine and gerontology. It shows how, at the population level, diet and exercise throughout the life course can reduce the threat of a global epidemic of chronic diseases.