

Comments were received from the following individuals and organizations during the public consultation on the draft WHO *Guideline: Sugars intake for adults and children*

Government agencies

Douglas Ackerman	Florida Department of Citrus, USA
Nawal Alhamad Alhamad	Food & Nutrition Administration, Ministry of Health, Kuwait
Donald Barker	Alberta Health Services, Canada
Lisette Brink	The Netherlands Nutrition Centre, Netherlands
Patricia Cecilia Cardoso	Administración Nacional de Medicamentos, Alimentos y Tecnología Médica - ANMAT, Argentina
Lara Comi	European Parliament, Italy
Yuk Ching Alex Fu	Department of Health, Hong Kong Special Administrative Region Government, China
Elisabetta Gardini	European Parliament, Italy
Andrea Ghiselli	Research Center on Food and Nutrition (CRA-NUT), Agricultural Research Council (CRA), Italy
Dr Sebastián Laspiur	Ministerio de Salud de la Nación (Ministry of Health), Argentina
Dr Isra Levy	Ottawa Public Health, Canada
Fabienne Meier	Federal Food Safety and Veterinary office FSVO
National Food Institute	National Drugs, Foods and Medical Technology Administration, Argentina
Eduardo Augusto Fernandes Nilson	Ministry of Health, Brazil
Public Health England	Public Health England, United Kingdom
Leanne Rodine	Alberta Health Services, Canada
Dr Barbara Seed	Supreme Council of Health, Qatar
Rusidah BT Selamat	Nutrition Division, Ministry of Health, Malaysia

Dr Robert Strang	Nova Scotia Department of Health and Wellness, Canada
Eretii Teretia Timeon	Nutrition Center, Ministry of Health, Kiribati
Blanca Cecilia Hernández Torres, Yenny Consuelo Velosa Melgarejo	Ministerio de Salud y Protección Social, Colombia
Maria Vezzoni	Public Health Unit - Azienda Sanitaria Locale Milano 2, Italy
Suvi Virtanen	National Institute for Health and Welfare, Finland
Anna Zaborska	European Parliament, Slovakia

UN agencies

Saskia De Pee	World Food Programme, Italy
Benoit Varenne	WHO Regional Office for Africa, Democratic Republic of the Congo

Nongovernmental and consumer organizations and associations

Cary Adams	The NCD Alliance, Switzerland
David Arnold	British Dental Health Foundation, United Kingdom
Bridget Benelam	British Nutrition Foundation, United Kingdom
Professor ED Berman, MBE	Inter-Action Social Enterprise Trust, United Kingdom
Dr Alison Boyd	Sugar Nutrition UK, United Kingdom
Xaviera Cabada	El Poder del Consumidor AC, Mexico
Pauline Castres	BEUC (European Consumer Organisation), Belgium
Dr David Cavan	International Diabetes Federation (IDF), Belgium
Sylvia Cheater	Food Act!ve, United Kingdom
Sylvia Cheater	Heart of Mersey, United Kingdom

Helen Cherrett	American Dental Association, USA
Janet E Collins	Institute of Food Technologists, USA
Dr Noelle Cotter, Dr Helen Mcavoy, Mr Owen Metcalfe	Institute of Public Health in Ireland (IPH), Ireland
Helen Crawley	First Steps Nutrition Trust, United Kingdom
Jean-Luc Eisele	FDI World Dental Federation, Switzerland
Jan Frank PhD	The Society of Nutrition and Food Science, Germany
Lisa Gable	Healthy Weight Commitment Foundation, USA
German Nutrition Society	German Nutrition Society, Germany
Pietro Giordano	ADICONSUM, Italy
Suzanne S Harris	International Life Sciences Institute, USA
Claire Hewat	Dietitians Association of Australia, Australia
Michael F Jacobson	Center For Science in the Public Interest, USA
Bill Jeffery	Centre For Science in the Public Interest , Canada
Steven Jenkins	The British Dietetic Association, United Kingdom
Mariell Jessup MD	American Heart Association/American Stroke Association, USA
Therese Junker	Swiss Heart Foundation, Switzerland
Ms Etain Kett	Dental Health Foundation, Ireland
Cho-Il Kim	Korea Health Industry Development Institute, Republic of Korea
Prof Berthold Koletzko (On Behalf Of FISPGHAN)	Federation of International Societies on Paediatric Gastroenterology, Hepatology and Nutrition (FISPGHAN), Germany

Tim Lobstein	World Obesity Federation, Formerly The International Association For The Study of Obesity (IASO) and The International Obesity Taskforce (IOTF), United Kingdom
Susanne Logstrup	European Heart Network (EHN), Belgium
Professor Graham Macgregor	Action On Sugar, Wolfson Institute of Preventive, Medicine Barts and The London School of Medicine & Dentistry, Queen Mary University of London, United Kingdom
Annette Matzke	NGO-Alliance Nutrition, Physical Activity and Body Weight, Switzerland (Cardiovasc Suisse, Swissheart, Forum Obesity Schweiz, Swiss Ligue Contre Cancer, Swiss Society of Public Health, Swiss Society of Nutrition SSN, Alliance of Swiss Consumers' Organisations), Switzerland
Aileen Mcgloin	Safefood, Ireland
Mariska Meurs	Wemos Foundation, Netherlands
Janis Morrissey	Irish Heart Foundation, Ireland
Modi Mwatsama	UK Health Forum and WCRF International, United Kingdom
Dr Robert Nuttall	Canadian Cancer Society, Canada
Sarah D Ohlhorst, MS RD	American Society for Nutrition, USA
Peter Pachner	Austrian Association for Public Health, Austria
Barbara Pfenniger	Fédération Romande des Consommateurs, Switzerland
Patti Rundall	Baby Milk Action, United Kingdom
Gerhard Konrad Seeberger	Italian Dental Association, AIO, Italy
Dorota Sienkiewicz	European Public Health Alliance (EPHA), Belgium
Terry Slevin	Cancer Council Western Australia, Australia
Amy Smullen	British Heart Foundation, United Kingdom
Elisabeth Sterken	International Baby Food Action Network, Canada

Maurice Swanson	Heart Foundation WA, Australia
Akikazu Takada	International Projects on Food and Health, Japan
Dr Georgios Tsakos	European Association of Dental Public Health, United Kingdom
Dr Janine Verheesen	Knowledge centre Sugar & Nutrition, Netherlands
Derek Yach	Executive Director; Vitality Institute (Part of Discovery Holdings, South Africa), USA

Private sector (including industry organizations and associations)

Monica Elizondo Andrade	Camara Costarricense de Industria Alimentaria, Colombia
Dr Geoffrey Annison	Australian Food and Grocery Council, Australia
Charles W Baker	Sugar Association, Inc, USA
Sharon Bligh	The Consumer Goods Forum, France
Leon H Bruner, DVM, PhD	Grocery Manufacturers Association, USA
Massimo Camperi	Ferrero Asia LTD, Singapore
J Agustin Valencia Dongo Cardenas	ASBEGA (Asociación de la Industria de Bebidas Gaseosas del Peru), Peru
Arianna Carughi PhD	Sun-Maid Growers of California, USA
Igor Von Broesigke Castro	Brazilian Association of Soft Drink and Non Alcoholic Beverages, Brazil
Richard Conrad Cottrell	World Sugar Research Organisation, United Kingdom
Maria Agnese Dau	Federalimentare - Italian Food & Drink Industry Federation, Italy
Mauro Fontana	Soremartec Italia SRL (Ferrero Group), Italy
Jamie Fortescue	European Starch Industry Association, AAF, Belgium
Jim Goetz	Canadian Beverage Association, Canada

Christine Teuna Fennie Grit	Federatie Nederlandse Levensmiddelen Industrie (FNLI) - Dutch Food and Groceries' Association, Netherlands
Barbara Groele	Krajowa Unia Producentów Soków (KUPS) - Polish Association of Juices Producers, Poland
Juan Fernando Gutierrez	Proyectos, Ecuador
Emilio Herrera	Asociacion Nacional de Productores de Refrescos y Aguas Carbonatadas, AC, Mexico
Ellen Hof	ENSA - European Natural Soyfoods Manufacturers Association, Belgium
Delon Human	International Food & Beverage Alliance, Switzerland
Carole May Inkster	New Zealand Food & Grocery Council, New Zealand
International Federation Of Fruit Juice Producers (IFU)	IFU, France
Edmundo Klotz	ABIA – Brazilian Association of Food Industries, Brazil
Dr Angela Kohl	German Federation for Food Law and Food Science (BLL), Germany
Katherine W Loatman	International Council of Beverages Associations, USA
Carolina Lorduy	Chamber of the Food Industry of the National Association of Colombia (ANDI), Colombia
Emilie Majster	European Committee of Sugar Manufacturers (CEFS), Belgium
Roberto Menta, MD PhD	Soremartec Italia SRL (Ferrero Group), Italy
Hugo Miguens	Camara Argentina de la Industria de Bebidas sin Alcohol (CADIBSA), Argentina
Sabine Nafziger	Chocolate, biscuits & confectionery of Europe (CAOBISCO), Belgium
Carolina Muro Niño	Spanish Food and Drink Industry Federation, Spain
Dominic Nolan	Australian Sugar Industry Alliance, Australia
Ing Gloria Cervera Perez	Camara Nacional del Maiz Industrializado (CANAMI), Mexico

Mario Piccialuti	AIDEPI, Italian Association of Confectionery and Pasta Industries, Italy
Andrea Poli	NFI- Nutrition Foundation of Italy, Italy
Andrew Resnick	Corn Refiners Association, USA
Francisco Roberto Herrarte Rivera	Gremial de Fabricantes de Alimentos (GREFAL), Guatemala
Dr Anne Roulin	Nestlé, Switzerland
Laurence Rycken	International Dairy Federation, Belgium
Sara Salvatore	Ferrero SPA, Italy
Ding Shaohui	China National Confectionery Association, China
Lurdes Soares	AIJN - European Fruit Juice Association, Belgium
Haley Stevens	Calorie Control Council, USA
Fuad Chiver Sucri	Asociación Nacional de Fabricantes de Chocolates, Dulces y Similares AC, Mexico
Jennifer Thompson	Australian Industry Group (Ai Group) - Confectionery Sector, Australia
Unionzucchero	Unionzucchero - Unione Nazionale Fra Gli Industriali Dello Zucchero, Italy
Maisie Vanriel	Food and Consumer Products of Canada, Canada
Dr Stefania Vezzosi	ANDID - Italian Association of Dietitians, Italy
Flora Wang	Canadian Sugar Institute, Canada
Diane Welland	Juice Products Association, USA
John S White, PhD	White Technical Research, USA
Martin Wickham	Leatherhead Food Research, United Kingdom

Livio Luzi	University of Milan, Italy
Dr Sean Mark	School of Population and Public Health, University of British Columbia, Canada
Sara Esther Valdés Martinez	Universidad Nacional Autónoma de México; Facultad de Estudios Superiores Cuautitlán; Laboratorio de Tecnología de Calidad en Alimentos, Mexico
Anne-Thea McGill	University of Auckland, New Zealand
Lindsey Morse	Imperial College, United Kingdom
Marco Peres, Jane Harford, Katrina Plastow, Jenny Miller	Australian Research Centre for Population Oral Health, School of Dentistry, The University of Adelaide, Australia
Len Piche, PhD RD	Nutrition, Brescia University College, Canada
Dr Phusit Prakonsai	International Health Policy Program (IHPP), Thailand
Andrew J Rugg-Gunn	Newcastle University, United Kingdom
Dr Arun K Simon	Manipal College of Dental Sciences, Manipal University, India
Yi-Xiang Su	School of Public Health, Sun Yat-Sen University, China
Professor Eugenio Del Toma	Campus Biomedico, Rome University, Italy
Bernhard Watzl	Max Rubner-Institute, Federal Research Institute of Nutrition and Food, Germany
Mark Weiss	UK Faculty of Public Health, United Kingdom
Shigeru Yamamoto, PhD RD	Ajian Nutrition and Food Culture Research Center, Jomonji University, Japan

Other individuals

Faye Cheeseman	Private citizen, United Kingdom
Jocelyn Guillot-Narvaez	Bariatric Friendly, USA
Susan Lesch	Private citizen

Bernard Morre	Private citizen, France
Benjamin Seeds	Private citizen, Switzerland
Sergio Pumarola Segura	Open Innovation Consultant, Spain
The Reverend Nathan D. Pihlo	Evangelical Lutheran Church In America, USA
Zoe Eaton	I Quit Sugar, Australia
Mary-Kate Hoogland	Sustainable Health, Australia
Dr DS Prasad, MD PhD	Sudhir Heart Centre, India

Summaries of comments received	Assessment and response
<p>Weight gain, as a risk factor for diabetes and other major NCDs, should be clearly distinguished from the effects of sugar on dental health throughout the guideline. Furthermore, an excessive intake of free sugars can lead, not only to overweight, but to an excess of visceral fat which is associated with insulin resistance, and can lead to type 2 diabetes in a person with normal body weight. Therefore, statements which restrict the link between high sugar intake and NCDs to its effect on body weight, do not address the whole dimension of the problem. Evidence also exists on the direct effects of free sugars intake (in the form of sugar-sweetened beverages) and type 2 diabetes as well as cardiovascular diseases. Therefore, discussions of sugars intake and diabetes and cardiovascular diseases and the risk of developing those NCDs should be included in the guideline. Speaking only about obesity and caries looks less important for health when you speak with the public as the recommendations seem to have purely focused on aesthetic goals (i.e. obesity and dental caries) whereas WHO's goals should be to provide recommendations to reduce the risk of NCDs in adults and children.</p>	<p>As stated in the guideline, when determining the scope of the guideline, the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health decided unhealthy weight gain and dental caries as the priority health outcomes to be focused on when undertaking the systematic reviews. This was in recognition of the rapidly growing epidemic of overweight and obesity around the globe and its role as a risk factor for several NCDs. In addition, dental caries is the most common NCD, and the cost of its treatment places a heavy burden on health-care budgets in many countries. But a need for systematic reviews and meta-analyses related to free sugars intake and blood lipid levels, blood pressure and diabetes-related outcomes (i.e. glucose, insulin, metabolic syndrome, prediabetes and insulin resistance) is suggested in the "Implications for future research" section of the guideline. It should be noted that while the finalization of the guideline was underway, a new systematic review was published in May 2014 by Te Morenga et al. which provided evidence that free sugars may influence cardiometabolic risk factors independently of changes in body weight, suggesting that a reduction in free sugars intake may also be beneficial for reducing risk of cardiovascular diseases. As such, this new systematic review also supports the recommendation to reduce intake of free sugars for health benefits.</p>
<p>Considering obesity and dental caries together is conceptually wrong. Obesity is a complex systemic disorder associated with hypertension, diabetes, cardiovascular diseases and dyslipidemia in the context of metabolic syndrome, while dental caries is a local effect of free glucose. Since the etiopathogenesis of obesity and dental caries are different, (and since the evidence for thresholds is based only on studies of dental caries), the recommendations to prevent those diseases should also be different.</p>	<p>How and why unhealthy weight gain and dental caries have been identified as priority healthy outcomes for developing this guideline are described in the "Scope and purpose" section of the guideline.</p>
<p>In the WHO Global Status Report on Noncommunicable Diseases 2010, the following four NCDs are listed: cardiovascular diseases, cancers, diabetes and chronic respiratory diseases. The NCD Global Action Plan 2013-2020 also focuses on these four NCDs. In the present</p>	<p>It is noted in the NCD Global Status Report that the primary focus of the report was on the four groups of diseases (i.e. cardiovascular diseases, cancers, diabetes and chronic lung diseases) which are responsible for the majority of deaths caused by NCDs and are largely caused by four shared</p>

<p>guideline, dental caries is also listed as an NCD. We prefer a more consistent communication and information and we would therefore appreciate putting the main focus on the four main NCDs (i.e. cardiovascular diseases, cancers, diabetes and chronic respiratory diseases).</p>	<p>behavioural risk factors. While the broader scope of noncommunicable conditions are not specifically addressed by the content and focus of the report, many of the approaches and opportunities for tackling NCDs described are also directly relevant to these conditions. It was not possible to state all NCD issues in the guideline; therefore, in the guideline, the reference was made to both the 2010 and 2014 NCD Global Status Reports where detailed information on NCDs can be found.</p>
<p>We suggest to include a reference not only to mortality as such, but in particular to premature mortality, a phenomenon illustrating a worrisome trend in relation to the NCDs from modifiable, avoidable – and to a great degree – unequally and unfairly distributed risk factors such as diets of poor nutritional quality. This is also particularly valid in the case of overweight and obesity which are a comorbidity of type 2 diabetes, certain cancers and cardiovascular diseases.</p>	<p>The “Background” section of the guideline is updated with the data provided in the 2014 NCD Global Status Report which also provides data on premature death.</p>
<p>The Codex Alimentarius, as the body that sets international food standards, guidelines and codes of practice for food and the food system, should be informed of the recommendations and ways should be identified as to how the Codex can or should use these recommendations.</p>	<p>WHO regularly informs relevant Codex Committees, such as the Codex Committees on Food Labelling (CCFL), and Nutrition and Food for Special Dietary Uses (CCNFSDU) of new and updated WHO nutrition guidelines and recommendations in order to encourage and ensure the use and incorporation of WHO guidelines in their on-going work in developing Codex standards and guidelines.</p>
<p>There is a need to stress the differences between this guideline and TR 916. TRS 916 addressed all major dietary and other issues to major NCDs and recommended guidelines on whole diet and active living. So the context is very different from this guideline which takes one nutrient and develops guidance for it without taking into consideration the needed changes in total calorie intake, i.e. shifts in intakes of fats and oils (that could result as people substitute one set of nutrients for another).</p>	<p>As noted in the guideline, this guideline is developed as part of the ongoing efforts of WHO to update existing dietary goals for the prevention of NCDs which was last updated in 2002 by the WHO/FAO Expert Consultation (TRS916 is the report of this expert consultation). Since the 2002 WHO/FAO Expert Consultation, the WHO guideline development process has changed as described in the WHO handbook for guideline development (2014), in order to implement procedures to ensure that WHO guidelines are developed in ways consistent with best practices, emphasizing the appropriate use of evidence. This change of the guideline development process led to the development of guidelines for each nutrient, given the available resources. The guideline development process that was implemented to develop this guideline is described in detail in the guideline. The guideline also highlights the need to use it in</p>

	<p>conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids in order to guide effective public health nutrition policies and programmes to promote a healthy diet.</p>
<p>During the public consultation, it should be allowed for people to provide different and other possible studies and data that should also be included as additional evidence in order to improve the transparency of WHO's guideline development process.</p>	<p>As described in the guideline, WHO follows the guideline development process which is guided by the WHO handbook for guideline development (2014).</p>
<p>The BMI chart used in a Pacific country states that normal BMI is 22-27, overweight is BMI 27-32, and obese is BMI > 32. Could this be highlighted as well in this guideline or should we (Pacific islanders) use the WHO's recommendation?</p>	<p>Discussing the BMI cut-off points for different population groups is beyond the scope of this guideline. The guideline included WHO BMI cut-off points to define overweight and obesity for the purpose of international comparison.</p>
<p>The 2007 FAO/WHO Scientific Update on Carbohydrates in Human Nutrition stated that there is no convincing scientific justification for differentiating between "free", "added" and "other" sugars. All sugars, whether added or naturally occurring, provide 4 kcal/gram, and have the same effect on health. There is no scientific evidence that the human body makes any physiological distinction between sugars that are added to foods and those that are naturally occurring. We further note that analytical techniques are unable to distinguish between sugars that are added to foods and naturally occurring sugars, as they are chemically identical. Therefore, the WHO Draft Guideline's focus on "free sugars" is unwarranted and has the potential to mislead consumers, and risks reinforcing misperceptions that added sugars are somehow more caloric or otherwise different from sugars inherent in many foods or beverages. It should also be noted that the Cummings & Stephen paper which was produced as part of the 2007 FAO/WHO Scientific Update on Carbohydrates in Human Nutrition states that "total sugars" is the term more widely recognised and is most useful.</p>	<p>In the paper prepared by Cummings & Stephen for the 2007 FAO/WHO Scientific Update on Carbohydrates in Human Nutrition, they stated that the term "total sugars" is probably the most useful way to describe and measure sugars "for labelling purposes". The key point they highlighted is related to measurement and labelling. It may be difficult to distinguish sugars present in the different compartments of a food or meal (i.e. intracellular or extracellular, from milk or fruit or vegetables). Therefore, Cummings & Stephen noted that the first step in any analysis and for labelling should be total sugars. But with regard to the physiology, the rate of digestion and absorption are determined by the physical properties of the food/meal in which the sugars are found. Therefore, consuming sugars as whole fruit (i.e. intrinsic sugars) would be different from consuming sugars as fruit juices (i.e. free sugars) in terms of the glycaemic, insulinaemic and satiety responses. Thus analytically these sugars are not different, but physiologically they are. As noted in various comments received, improved communication to the consumers and development of effective communication strategies and materials could facilitate the understanding of the recommendations which will lead to effective implementation of the guideline.</p>
<p>The statement that "free sugars contribute to the overall energy density of diets" is misleading since all macronutrients add energy density to the diet. All sugars contribute 4 kcal/gram, whereas fat</p>	<p>As stated in the guideline, the objective of the guideline is to provide recommendations on the intake of free sugars to reduce the risk of NCDs in adults and children, with a particular focus on the</p>

<p>contributes 9kcal/gm. If the main concern is the energy density of the diet, the guideline should be made on the amount of all macronutrients in the diet and thus the amount of calories that should be eaten, not just on the amount of free sugars in the diet. A calorie is a calorie and excess energy intake in any form will contribute to weight gain.</p>	<p>prevention and control of unhealthy weight gain and dental caries. Both the 1989 WHO Study Group and 2002 WHO/FAO Expert Consultation reviewed global and regional food consumption patterns and trends as well as dietary changes in some countries as part of their work and stated, (in the 2002 WHO/FAO Expert Consultation in particular), that free sugars contribute to the overall energy density of diets and when the energy density of the diet is increased, total energy intake is increased, citing a number of studies on the subject. As clearly indicated in the “Translation and implementation” section of the sugars guideline, the guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet. WHO also provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>The claim that high levels of free sugars intake is associated with poor dietary quality are not supported by evidence. The relationship between sugars intake and the nutrient quality of diets was not reviewed in the current exercise and was not reviewed in the previous two WHO expert consultations that are cited as reference for this claim.</p>	<p>Both the 1989 WHO Study Group and 2002 WHO/FAO Expert Consultation reviewed global and regional food consumption patterns and trends as well as dietary changes in some countries as part of their work and stated,(in the 2002 WHO/FAO Expert Consultation in particular), that free sugars contribute to the overall energy density of diets and when the energy density of the diet is increased, total energy intake is increased, citing a number of studies on the subject.</p>
<p>The evidence supporting the recommendation is based on studies in which it was determined that changes in total energy intake were responsible for changes in body weight and not from consumption of free sugars per se: free sugars do not affect body weight when isocalorically substituted for other nutrients. This is not prominently noted in the guideline.</p>	<p>A statement, "The excess body weight associated with free sugars intake results from excess energy intake" is included in the “Remarks” section of the guideline to highlight the importance of energy balance.</p>
<p>Increased free sugars intake may result in weight gain under ad libitum conditions; however, this is also true of dietary fat and is primarily an effect of food energy density. Conversely, similar effects in terms of preventing weight gain can be achieved by reducing either fat or free sugars intake with a goal of limiting energy intake.</p>	<p>As clearly indicated in the “Translation and implementation” section, the guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a</p>

	<p>healthy diet. WHO also provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>WHO Consultation on Obesity (TRS 894) commented “Dietary fat has a higher energy density than other macronutrients. This is thought to be largely responsible for the overeating effect, or passive overconsumption as it is often called, experienced by many subjects exposed to high-fat foods”. Thus a reduction in sugar intake might lead to an increase, rather than a decrease, in the prevalence of obesity, if free sugars are replaced by dietary fats. A FAO/WHO Expert Consultation has commented under Principles of carbohydrate food choices “to acknowledge that there may be unintended consequences involved in carbohydrate food intake change, and also to ensure that risks involved in dietary changes from traditional diets is considered”. National policies to restrict consumption of sugars might therefore not only be expensive and ineffective, but could damage the public’s health by inadvertently leading to higher consumption of fats.</p>	<p>In order to avoid such unintended consequences, it is indicated clearly in the “Translation and implementation” section that this guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet. This is a nutrient guideline which needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at the country level. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline.</p>
<p>The observed effects on body weight are small, such that the findings cannot be extrapolated to population-based advice.</p>	<p>The recommendations in the guideline target individuals, not populations.</p>
<p>When assessing the effects of consuming a particular nutrient on body weight, an individual’s total energy intake, their nutritional, socioeconomic and cultural status, access to foods and other factors must also be considered. The etiology of obesity is multifactorial and approaches to prevention should be addressed from the perspective of overall healthy lifestyle.</p>	<p>This is a nutrient guideline which needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at country level. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline. The guideline also highlights the need to use it in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids in order to guide effective public health nutrition policies and programmes to promote a healthy diet. WHO also provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work. Furthermore, comprehensive strategies to prevent and control NCDs (including obesity) are provided in the NCD</p>

	Global Action Plan 2013 - 2020 which was endorsed by the World Health Assembly in 2013.
Weight gain is caused by energy imbalance (consuming more energy than expending through physical activity). The importance of physical activity was not stressed.	The importance of physical activity is addressed in various other WHO documents including Global recommendations on physical activity for health (2010). However, it should be noted that the guideline recognizes the importance of energy balance and therefore, a statement, "The excess body weight associated with free sugars intake results from excess energy intake" is included in the "Remarks" section of the guideline.
The role of portion size in weight gain is not considered. The guideline should promote healthy diet and lifestyles including the control of portion size to reduce the overall calorie intake.	In the "Translation and implementation" section of the guideline, some examples of how the recommendations of this guideline can be used by policy-makers, programme managers and other stakeholders are included. It is also stated that providing comprehensive overall dietary guidance, including other issues such as portion size, is beyond the scope of this guideline, because such guidance should be based on overall dietary goals that consider all required nutrients. WHO provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.
The studies included in the analysis of body weight include those with sugars and foods containing sugars as exposure/intervention. Foods containing sugars also contain other nutrients contributing to total energy intake. The review fails to indicate if this was accounted for.	The evidence for the effect of sugars on body weight is largely derived from randomized controlled trials of studies involving free living subjects. The intention in these randomized trials was to compare the effects of altering the proportion of total energy provided by free sugars without altering overall macronutrient distribution. When energy intakes were strictly controlled there was no effect of sugars on body weight. When not strictly controlled those consuming higher sugars diets did not adequately compensate for the additional energy provided by increased sugars by reducing intake of other energy sources. Similarly when subjects reduced their sugars intake they did not adequately compensate for the reduction by increasing intake of other energy sources.
Many of the body weight studies involved an explicitly counselled or mandatory consumption of an added energy load as sugars, and compared this to a lower-energy or energy-free load. Thus, it is not clear if these are really a test of sugars specifically or supplemental energy in general.	The evidence for the effect of sugars on body weight is largely derived from randomized controlled trials of studies involving free living subjects. The intention in these randomized trials was to compare the effects of altering the proportion of total energy provided by free sugars

	<p>without altering overall macronutrient distribution. When energy intakes were strictly controlled there was no effect of sugars on body weight. When not strictly controlled those consuming higher sugars diets did not adequately compensate for the additional energy provided by increased sugars by reducing intake of other energy sources. Similarly when subjects reduced their sugars intake they did not adequately compensate for the reduction by increasing intake of other energy sources.</p>
<p>In the evidence summary, clarification is needed as to how the effects of total energy intake were distinguished from the effects of free sugars intake in the body weight studies included in the systematic review.</p>	<p>Clarification can be found in the systematic review by Te Morenga et al. (2013). The evidence for the effect of sugars on body weight is largely derived from randomized controlled trials of studies involving free living subjects. The intention in these randomized trials was to compare the effects of altering the proportion of total energy provided by free sugars without altering overall macronutrient distribution. When energy intakes were strictly controlled there was no effect of sugars on body weight. When not strictly controlled those consuming higher sugars diets did not adequately compensate for the additional energy provided by increased sugars by reducing intake of other energy sources. Similarly when subjects reduced their sugars intake they did not adequately compensate for the reduction by increasing intake of other energy sources.</p>
<p>Most of the studies on body weight in children relate to liquid calories from sugar; thus there is no evidence of an association with free sugars from solid food and body weight in children.</p>	<p>There was no effect of reducing sugars (from beverages and foods) on body weight in the randomized controlled trials in children. Most of the 21 cohort studies in children included sugar-sweetened beverages exclusively as the exposure but some of those with solid food exposures (e.g. snacks, candies, chocolates) demonstrated a positive association with body weight. The cohort studies that were subjected to GRADE analysis and subsequently used in the formulation of the recommendations all reported sugar-sweetened beverage exposures.</p>
<p>Some of the body weight studies were not representative of normal human behaviour (e.g. participants in some studies consumed very high or very low quantities of free sugars, in one case 438 grams per day) and thus have limited applicability in free-living populations.</p>	<p>Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013). Free sugars intake also varies widely in many populations. Exclusion of the study involving very high sugars intakes (i.e. 438 grams per day) did not influence the outcome.</p>

<p>The body weight analysis is based largely on short-term intervention studies which have limited applicability in real world settings.</p>	<p>Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013). The need for longer term controlled trials of the effect of increasing or decreasing free sugars intake on body weight is noted in the “Implications for future research” section of the guideline.</p>
<p>Although an association between sugars intake and weight gain was observed in the analysis of body weight studies, it is unclear if the duration of many of the studies was sufficient to detect more significant changes in body weight.</p>	<p>Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013), which includes duration of the studies. These were discussed and agreed upon by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health in order to determine the scope of the review. The need for longer term controlled trials of the effect of increasing or decreasing free sugars intake on body weight is recognized, and therefore noted in the “Implications for future research” section of the guideline.</p>
<p>A dose-response relationship between sugar intake and body weight was not observed which contradicts the statement that increasing or decreasing sugars intake is associated with parallel changes in body weight, regardless of the level of intake. No evidence for this statement has been provided.</p>	<p>A dose-response was not described in the systematic review, however, there was a consistent positive effect of higher sugars intakes on body weight at all levels of intake.</p>
<p>The evidence presented for body weight does not provide the rationale for the recommendations to reduce intake of free sugars to 10% and 5% of total energy intake.</p>	<p>As noted in the “Remarks” section of the guideline, thresholds were determined based on the evidence from analysis of the impact of free sugars intake on dental caries which was identified by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health as a priority health outcome for developing recommendations for free sugars.</p>
<p>The evidence linking free sugars intake and body weight relies heavily on studies of sugar-sweetened beverage consumption. Placing more emphasis on the contribution of sugar-sweetened beverages to intake of free sugars would provide a practical message to be incorporated into food-based dietary guidelines.</p>	<p>The focus of the guideline is related to the intake of free sugars, not sugar-sweetened beverages, although sugar-sweetened beverages are included as one of the exposures when undertaking the systematic reviews, given their contribution to free sugars intake among various population groups. Additionally, this guideline is a nutrient guideline which then needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available</p>

	<p>food and dietary customs at country level. Information on how the recommendations can be implemented and translated into action is also noted in the “Translation and implementation” section of the guideline which includes examples of measures that are already being implemented by countries, including food and nutrition labelling, regulation of marketing of foods and non-alcoholic beverages that are high in free sugars, and fiscal policies targeting foods and beverages that are high in free sugars.</p>
<p>Sugar-sweetened beverages are the main source of added sugar in the daily diet of many children. The possible association between high intake of sugar-sweetened beverages and childhood obesity deserves more attention.</p>	<p>The focus of the guideline is related to the intake of free sugars, not sugar-sweetened beverages, although sugar-sweetened beverages are included as one of the exposures when undertaking the systematic reviews, given their contribution to free sugars intake among various population groups.</p>
<p>The recommendations should focus on sugar-sweetened beverages as there are more supportive studies for this than for the broader category of free sugars.</p>	<p>Consumption of sugar-sweetened beverages was identified as one of the exposures, but not the only exposure, when developing the PICO questions (Annex 6) which guided the scope of the systematic reviews. As such, the evidence reviewed was not limited to sugar-sweetened beverages only. It is, therefore, not possible to make specific recommendation on sugar-sweetened beverages in this guideline.</p>
<p>Results from studies released since the publication of the systematic review (Ebbeling et al. [2012]; de Ruyter et. al. [2012]; Qi et al. [2012]), support the association between sugar-sweetened beverages and weight gain.</p>	<p>Comment noted.</p>
<p>Results from Ebbeling et al. (2012) and de Ruyter et. al. (2012) do not support an association between sugar-sweetened beverages and weight gain.</p>	<p>Overall the authors’ conclusion in both reviews cited in the comment was that intake of sugar-sweetened beverages is associated with body weight. The detailed comments received during the public consultation indicating that the studies that do not show an association between sugar-sweetened beverages select only certain aspects of the studies that support the assertion that there is no association (e.g. no effect was observed at the pre-specified 2 year time point in Ebbeling et al. [2012], but a significant effect was observed at 1 year; potential bias and a small but significant difference in BMI increase in de Ruyter et al. [2012]).</p>

<p>The conclusions drawn regarding free sugars intake and body weight were based on the results of the meta-analysis by Te Morenga et al. (2013) which had limitations including risk of bias in some studies, publication bias and heterogeneity across studies. There was no convincing evidence from RCTs in adults that there was an effect of limiting dietary sugars on measures of body fatness when analysis was limited to studies that did not have a high risk of bias. In the adult cohort studies, only six of the 23 associations were statistically significant and these came primarily from one or two studies. No effect was observed in RCTs in children. In cohort studies, six out of several associations were significant and four reported a negative association. There are questions regarding the way some studies have been computed in the meta-analysis, which may have affected the magnitude of effect. The limitations of the review create uncertainty about the results and conclusions.</p>	<p>Study limitations are noted in the systematic review and addressed in the GRADE evidence profiles included in the guideline (Annex 1), which include a discussion of the effects of potential bias and heterogeneity on the strength of the recommendation, and are included in the guideline. No specific evidence provided regarding the comment questioning the way in which some studies have been computed in the meta-analysis. Similar comments addressing methodological questions about the systematic review that were published in peer-reviewed journals (i.e. BMJ) have already been answered in published replies from the authors.</p>
<p>The evidence does not support a causal association between sugar intake and weight gain, overweight or obesity.</p>	<p>The systematic review conducted by Te Morenga et al. (2013) suggests an association between sugars intake and body weight.</p>
<p>Fructose has a uniquely obesogenic effect, as it can't be metabolized by most body cells. Instead, it is metabolized by the liver, leading to fatty liver disease, insulin resistance and high blood pressure (via uric acid production, blocking endothelial nitric oxide), and the production of atherogenic LDL cholesterol, causing heart disease.</p>	<p>The focus of the guideline is related to the intake of free sugars which include monosaccharides (of which fructose is part) added to foods and beverages. Individual monosaccharides were not considered separately as exposures and it is not the intention of this guideline to provide specific recommendations on fructose per se.</p>
<p>Fructose is not uniquely obesogenic. Fructose is metabolised differently from glucose although evidence suggests that fructose is no more obesogenic than glucose (or other carbohydrates), nor does it appear to differ in its effect on insulin or markers of fatty liver disease. Fructose may have important advantages over glucose for body weight, glycaemic control and blood pressure.</p>	<p>The focus of the guideline is related to the intake of free sugars which include monosaccharides (of which fructose is part) added to foods and beverages. Individual monosaccharides were not considered separately as exposures and it is not the intention of this guideline to provide specific recommendations on fructose per se.</p>
<p>To inform the future application of the recommendations, it would have been useful to draw out from the review more detail about the amount and/or type of sugars consumption (increases or decreases in intake) that has a measureable effect on body weight.</p>	<p>The focus of this guideline is free sugars and details of the various studies that assessed different sugars exposures are provided in the systematic review on body weight by Te Morenga et al. (2013).</p>

<p>The Te Morenga et al. (2013) review misrepresents the purpose of a number of studies and selects only part of their results.</p>	<p>There is no specific evidence of this noted in the comment. Comments addressing any methodological questions about the systematic review that were published in peer-reviewed journals (i.e. BMJ) have already been answered in published replies from the authors.</p>
<p>No randomized controlled trials in children were included in the analysis of free sugars intake and body weight.</p>	<p>Randomized controlled trials in children were included in the systematic review and meta-analysis by Te Morenga et al. (2013) which provided background evidence for developing the guideline.</p>
<p>Suggestions that free sugars, particularly in beverage form, are particularly obesogenic possibly as a result of a reduced ability to compensate for overall dietary energy intake is challenged by evidence suggesting that most of the energy consumed as sugar-sweetened beverages can be compensated for, resulting in little net gain in overall dietary energy.</p>	<p>While some studies suggest that most of the energy consumed as sugar-sweetened beverages can be compensated for, a substantial body of evidence suggests a reduced ability to compensate.</p>
<p>For interpretation, it is important to know over how long a time period the body weight studies contributing to the body weight analysis took place, how much the extra, or reduced, sugars intake contributed to additional, or reduced, energy intake, and whether or not there were other concurrent changes in dietary intake.</p>	<p>Details of the studies can be found in the systematic review by Te Morenga et al. (2013) which also provides references for all individual studies included in the systematic review.</p>
<p>The evidence seems to suggest that as long as energy intake is in balance with energy needs, the level of sugars does not matter, until it leads to inadequate intake of protein, fat and other essential nutrients. If a level at which this occurs is known, it would be good to state that.</p>	<p>The effect of altering sugars intakes by replacement with macronutrients other than carbohydrate was not assessed. The systematic review shows that subjects appear to increase energy intake when starchy carbohydrates are replaced with free sugars, or free sugars intakes increase. This appears due to inadequate compensatory reduction in other carbohydrate sources. However, the trials were ad libitum in nature and carried out in free living individuals, so it is possible that the interventions resulted in some differences in intakes of other macronutrients. Additionally, the logic used in this comment only considers the effects on body weight and ignores the effects of sugars intake on dental caries and, as suggested by recent publications, possible effects on cardiovascular disease risk.</p>
<p>The summary of the evidence on body weight does not appear to take into account the</p>	<p>As noted in the comments submitted, there are many examples of regional and national institutions</p>

<p>conclusions reached by other expert committees (e.g. EFSA [2010], IOM [2005], WHO/FAO [1997], UK Department of Health [1989], the Dietary Guidelines Advisory Committee convened by the US Department of Agriculture and the Department of Health and Human Services [2010], the guideline of the German Nutrition Society [2012]) regarding sugars intake and body weight.</p>	<p>or other bodies which have published guidelines and reports related to sugars intake and body weight. Therefore, it is not possible to select and consider the work of only a few such institutions in WHO guidelines. In terms of formulating recommendations, WHO conducts an independent review of the evidence following the WHO guideline development process as outlined in the WHO handbook for guideline development (2014), which includes rating the quality of evidence using GRADE methodology. Additionally, it should be noted that three of the positions to which this comment refers are taken from conclusions based on dated evidence (i.e. IOM [2005], FAO/WHO [1997], UK Department of Health [1989]). The current perspectives of other organizations providing dietary advice are in line with the WHO recommendations, including the American Heart Association, the European Heart Network and the UK Scientific Advisory Committee on Nutrition (draft report) which was issued for public consultation in May 2014 and is currently being finalized.</p>
<p>The guideline of the German Nutrition Society does not allow the conclusion that sugar is causally linked to the prevention of obesity, because no association of isocaloric exchange of sugar against other carbohydrates and weight change could be established.</p>	<p>There are many examples of regional and national institutions or other bodies which have published guidelines and reports related to sugars intake and body weight. However, for developing and updating dietary guidelines or recommendations, WHO conducts an independent review of the evidence following the WHO guideline development process as outlined in the WHO handbook for guideline development (2014), which includes rating the quality of evidence using GRADE methodology.</p>
<p>The Dutch Health Council concludes in the Guidelines for a healthy diet 2006, that there is insufficient evidence to make quantitative recommendations on free sugars intake with respect to the prevention of noncommunicable diseases.</p>	<p>There are many examples of regional and national institutions or other bodies which have published guidelines and reports related to sugars intake and NCDs. However, for developing and updating dietary guidelines or recommendations, WHO conducts an independent review of the evidence following the WHO guideline development process as outline in the WHO handbook for guideline development (2014), which includes rating the quality of evidence using GRADE methodology. After the review, the available evidence was considered sufficient to support recommendations on thresholds for free sugars intake as described in the guideline.</p>

<p>Other bodies (EFSA, IOM) have not set thresholds for sugar intake on the basis of reducing risk of dental caries as the available evidence was considered insufficient to do so.</p>	<p>There are many examples of regional and national institutions or other bodies which have published guidelines and reports related to sugars and dental caries. However, for developing and updating dietary guidelines or recommendations, WHO conducts an independent review of the evidence following the WHO guideline development process as outline in the WHO handbook for guideline development (2014), which includes rating the quality of evidence using GRADE methodology. After the review, the available evidence was considered sufficient to support recommendations on thresholds for free sugars intake as described in the guideline.</p>
<p>There is no convincing evidence that sugar is addictive or encourages excessive or uncontrollable consumption.</p>	<p>Nowhere in the guideline is it suggested that sugars are addictive or responsible for uncontrollable consumption.</p>
<p>Since there is an association between reductions of free sugars intake and a reduction of body weight (principally based on a reduction of sugar-sweetened beverages), an increase in water intake throughout the life-course should be recommended.</p>	<p>Comment noted.</p>
<p>Energy-dense diets, characterised by consumption of ultra-processed foods and beverages that are high in fat, sugar and salt, and low in nutrients and fibre, are the direct cause of the obesity pandemic.</p>	<p>Comment noted.</p>
<p>Excess weight gain, as one of the key outcomes of concern in relation to free sugars intake, is applicable to additional NCDs, including cancer. Being overweight or obese increases the risk of breast, colorectal, esophagus, kidney, pancreas and uterine cancer, and may increase the risk of ovarian and gallbladder cancer.</p>	<p>Comment noted.</p>
<p>In the US, where trends in intake and BMI data have been recently published, consumption of sugar-sweetened beverages have been declining while rates of obesity over the past decade have not changed.</p>	<p>The evidence and guidance presented in the guideline do not claim that sugars are the only macronutrient implicated in unhealthy weight gain. As noted in the guideline, this guideline on sugars intake should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet.</p>

<p>The latest National Diet and Nutrition Survey data shows that sugar intake is reducing in nearly all groups of the UK population and yet obesity is increasing, therefore other factors (e.g. energy expenditure) must be involved.</p>	<p>The guideline notes the importance of energy balance in the “Remarks” section. In addition, it is stated that this guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet.</p>
<p>There are some studies showing the inverse correlation between sugar intake and body weight, i.e. those with higher sugars intake are less likely to be overweight.</p>	<p>A systematic review was conducted to review the available evidence related to the intake of free sugars and weight gain, and recommendations were made based primarily on the evidence from the meta-analysis of randomized controlled trials comparing higher versus lower sugars intakes on body weight. Overall, the cohort studies included in the systematic review did not contradict the findings of the meta-analysis.</p>
<p>An ILSI-supported re-analysis of the IOM “Appendix J: Association of Added Sugars Intake and Intake of Other Nutrients” (2002) showed that those in the analysis with low added sugars intake (< 5% of energy) had a similar BMI to those with high added sugars intake (> 35% of energy): 28.9 compared to 28.1, respectively. Of persons who were overweight or obese, the highest proportions reported consuming between 5 and 15% of their energy from added sugars. With each 5% increase in added sugars intake above 15% added sugars intake, a lower prevalence of overweight and obese individuals was found, until the highest category of sugars intake was reached (>35%).</p>	<p>Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013). Results of the ILSI-supported analysis are noted, however this analysis was not included in the systematic review of evidence for free sugars intake and weight gain as it was not identified as meeting the inclusion criteria for the systematic review.</p>
<p>In 2013, Cancer Council Western Australia undertook a review of the literature on the effect of sugar-sweetened beverages consumption on health. The conclusions drawn were consistent with the WHO draft guidelines on sugars; there was a positive association between consumption of added sugars and body weight.</p>	<p>Comment noted.</p>
<p>Regarding free sugar intake and obesity the currently accepted causal pathway is: Excess energy intake -> positive energy balance -> obesity -> noncommunicable disease. An alternative causal pathway would be: Factor X (excess free sugar intake?) impacting both obesity and NCDs directly in addition to a possible interaction of</p>	<p>Comment noted.</p>

<p>obesity and NCDs. There is mounting evidence of the latter hypothesis – as is evidenced by the phenomena of metabolically obese lean individuals and metabolically lean obese individuals.</p>	
<p>Recent evidence suggests that dietary sugars may be independently associated with higher blood pressure, coronary heart disease and cardiovascular mortality and that reducing consumption of sugar-sweetened beverages and dietary sugars are associated with reduced blood pressure.</p>	<p>A recent systematic review by Te Morenga et al. (2014) and large observational study by Yang et al. (2014) provide evidence supporting an association with cardiovascular disease risk factors.</p>
<p>The most recent studies show no correlation between mortality and sugars intake across a wide range of sugars intake.</p>	<p>A recent observational study by Yang et al. (2014) identified a significant relationship between added sugar consumption and increased risk for cardiovascular disease mortality, noting that those consuming less than 10% of calories as added sugars had lower risk than those consuming more.</p>
<p>Frequency of sugars consumption, and not amount, is the most important risk factor for dental caries. Other factors that may affect risk of dental caries include stickiness or viscosity of foods, presence of compounds that can inhibit the activity of oral pathogens, microflora in the mouth, acidity of foods and beverages, the potential of consumed food to stimulate saliva production, whether or not one smokes, fluoride exposure, oral hygiene and socioeconomic status. These are not considered in the guideline.</p>	<p>With respect to amount vs. frequency of sugars intake and risk of dental caries, the evidence review shows that both are important. But few studies have measured both variables simultaneously to enable the relative importance of these variables to be judged while there is a greater wealth of evidence pertaining to amount of sugars and dental caries. The studies that have measured both frequency and amount of sugars simultaneously in the same population (e.g. Rugg-Gunn et al. [1984], Rodrigues et al. [1999]) have found that the two variables are correlated. Reducing the frequency of free sugars intake in the absence of a reduction of amount will not reduce the risk of not only dental caries, but also unhealthy weight gain and NCDs as a whole. Regarding the effects of viscosity of food and consumption of starches, the evidence review was also conducted by the 2002 WHO/FAO Expert Consultation and data did not suggest their more decisive role than the amounts of sugars consumed. As far as oral hygiene is concerned, it is indicated in a number of studies that when oral hygiene is controlled for, the relationship between sugars intake and dental caries still exists. Various references included in both the systematic review and the guideline provided data on these issues including Rugg-Gunn et al. (1984), Ruottinen et al. (2004), Rodrigues et al. (1999), WHO (2003).</p>

<p>Other factors (as listed in the above comment) affecting risk of dental caries were not considered in the systematic review and may have confounded the results obtained from the studies included in the review.</p>	<p>There is not strong evidence that these factors have a significant role to play in caries risk, independent of free sugars. The relationship between sugars intake and dental caries persists in the presence of exposure to fluoride, for instance. The cohort studies in the GRADE analysis all considered exposure to fluoride which did not differ between both lower and higher sugars groups. The GRADE analysis took into account the fact that ecological studies did not consider confounding factors and the quality of the evidence was downgraded accordingly.</p>
<p>Possible confounders of studies of sugars intake and dental caries, include adequate dental care and exposure to fluorides (e.g. drinking water, toothpaste, etc.). However, even with good dental care there is a progressive increase in the incidence of dental caries if sugar intakes are high. Also, fluoride can reduce, but does not entirely prevent the development of dental caries.</p>	<p>Comment noted.</p>
<p>Reducing free sugars intake is presented as a means to reduce the risk of dental caries. However, water fluoridation, access to dental care and good oral hygiene (including the use of fluoride toothpaste) are all very effective at reducing the risk of dental caries and have been responsible for significant reductions in dental caries in many populations worldwide. These are not adequately discussed in the guideline.</p>	<p>The guideline acknowledges that such practices have reduced the prevalence of dental diseases significantly. However, it also notes that a number of studies show that when oral hygiene is controlled for, the relationship between sugars intake and dental caries still exists.</p>
<p>The evidence presented does not take into consideration oral hygiene. It is unlikely that consumption of free sugars will increase risk of dental caries if proper oral hygiene is practiced. It would be better to state that the benefits (in terms of reducing risk of dental caries) associated with reducing free sugars intake to below 5% of total energy intake doesn't apply to populations with proper oral hygiene.</p>	<p>Noted in guideline that dental caries persists even when populations are exposed to fluoride (e.g. from oral hygiene).</p>
<p>Many mid- and high-income countries with higher intakes of free sugars (i.e. greater than 10% of total energy) now have lower caries prevalence than many of the countries with low sugars intake as a result of water fluoridation, improved dental care and improved oral hygiene.</p>	<p>The guideline acknowledges that such practices have reduced the prevalence of dental diseases significantly, in children. However, it is also noted that dental caries persists even in fluoridated populations and progresses with age.</p>
<p>Even in some high-income countries, water fluoridation is not universal and barriers to</p>	<p>Comment noted.</p>

obtaining adequate oral health care exist.	
Countries with estimated intake of sugars below 10% or 5% of total energy intake do not invariably have low caries prevalence.	Five population studies in the systematic review that allowed comparison of dental caries when sugars intake was below 10% of total energy intake compared with above 10% of total energy intake, showed lower caries when sugars intake was below 10% of total energy intake. There are few data from countries with intakes below 5% of total energy intake.
Evidence that dietary sugars are the major cause of dental caries comes from a wide spectrum of sources including human intervention studies, human observational studies, extensive animal studies, in vivo short-term studies, laboratory studies.	Comment noted.
There is a substantial body of scientific evidence indicating that free sugars are not uniquely responsible for dental caries. All fermentable carbohydrates (including some starches) can cause dental caries.	There is convincing evidence that non-processed starches are not associated with dental caries. Plaque pH and enamel slab experiments suggest that processed starches are acidogenic, but these data are not backed up with epidemiological studies. There are very few longitudinal data on the impact of processed starches on caries increment and only one paper has shown a non-significant trend ($p < 0.1$) (Chankanka et al. 2011).
The guideline focuses heavily on sugar-sweetened beverages and juice. The guideline would benefit from discussion of the impact of solid, sugar-sweetened foods, particularly those that children and adults tend to consume outside of meal times when there are no other foods that help buffer the acidic environment created by sugar in the mouth.	In accordance with the PICO questions (Annex 6) which were developed by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health, sugars from liquid and solid food sources were considered together.
There is evidence that different relationships between sugars consumption and dental caries may exist in different populations. For example, results from at least one study suggest that some countries with a high national income and low income inequality have a negative association between per capita sugar consumption and caries, whereas countries with a low income and high income inequality have a strong positive relationship between caries and sugar consumption.	Various factors affecting risk of dental caries (i.e. frequency of sugars consumption, stickiness or viscosity of foods, acidity of foods and beverages, fluoride exposure, level of oral hygiene, etc.) will also influence levels of dental caries in populations. However, it is noted that dental caries persists even in fluoridated populations and progresses with age.

<p>The guideline lacks a holistic approach to reducing dental caries. In addition to a dietary approach there are other parallel strategies for preventing caries: the mechanical biofilm removal, chemical biofilm manipulation, professional tooth cleaning and preventive care programs, stimulating saliva secretion by use of chewing gum, fluoridation measures and fissure sealing.</p>	<p>This is a guideline on sugars intake and therefore, does not provide detailed guidance on the prevention of dental caries which is provided in other WHO guidance documents specifically focused on oral health.</p>
<p>Most of the available data are for children so the relationship between sugars intake and dental caries in adults is unclear.</p>	<p>The cumulative nature of dental caries and the relationship between caries in childhood and adulthood are described in the systematic review and also in the guideline.</p>
<p>Different formulations of the same “free sugars” might have different effects on dental caries depending on what other nutrients are consumed alongside the sugars.</p>	<p>Comment noted.</p>
<p>Some sugars (i.e. isomaltulose and tagatose) do not promote dental caries and carry approved caries prevention health claims in the European Union and in the United States of America.</p>	<p>Comment noted.</p>
<p>In most epidemiological studies, dental caries is recorded only if it affects the dentine and results in cavitation. However, the disease is initiated much earlier and there is currently a move towards identifying early stages of the disease (i.e. enamel caries). This is important as it can facilitate early identification of population groups at higher risk for dental caries.</p>	<p>Comment noted.</p>
<p>The conclusions drawn regarding sugars intake and dental caries were based on the results of the systematic review which had limitations including methodological weaknesses in studies and heterogeneity across studies.</p>	<p>Any existing study limitations are noted in the systematic review by Moynihan and Kelly (2014) and were also addressed in the GRADE evidence profiles included in the guideline (Annex 1). Evidence was downgraded as necessary in response to the study limitations.</p>
<p>No high-quality intervention studies were included in the systematic review on free sugars intake and dental caries.</p>	<p>No high-quality intervention studies were identified meeting the inclusion criteria (two non-randomized intervention trials were identified for adults).</p>
<p>No studies in adults were considered in the systematic review on free sugars intake and dental caries.</p>	<p>The results of the 5 studies in adults were reported in the systematic review by Moynihan and Kelly (2014). However, differences in study design and other related factors, precluded pooling data for GRADE analysis.</p>

<p>Regarding free sugars intake and dental caries, data from the same eight studies conducted in children were used to answer different research questions and to develop recommendations for the general population.</p>	<p>The studies included in the systematic review by Moynihan and Kelly (2014) were considered by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health to be the best available for answering the particular research questions.</p>
<p>None of the studies included in the systematic review on dental caries were conducted in developing countries which limits the generalizability of the recommendations.</p>	<p>One study included in the review (but not in the subset of studies used to formulate the recommendations) assessed per capita sugars availability and dental caries in a number of developing countries; the physiological process of dental caries formation in relation to sugars intake is not expected to be different across different populations. The need for studies in developing countries is noted in the “Implications for future research” section of the guideline, as the “need to undertake new cohort studies with improved methodology for assessing dietary intake in areas that have or have not been fluoridated.”</p>
<p>The Moynihan and Kelly (2014) review and the Draft Guideline confuse the weaker protective effect of fluoride in water supplies with the much more effective application of fluoride in toothpaste. The Draft Guideline ignores the profound benefits that have been seen from fluoride toothpaste, despite clear evidence that its use is the most effective public health approach to dental decay.</p>	<p>The guideline acknowledges that adequate oral care and exposure to fluoride have reduced the prevalence of dental diseases significantly in many countries; however, it is also noted that dental caries persists even in fluoridated populations that have access to oral care.</p>
<p>Dried fruits, including raisins, have traditionally been thought to promote dental caries due to their suspected “stickiness” and sugar content. Current research identifies evidence to the contrary. These studies conclude that raisins consumption does not drop oral pH below the threshold that contributes to enamel dissolution; do not remain on the teeth longer than other foods, and contain a variety of compounds that inhibit <i>Streptococcus mutans</i>, bacteria that cause dental caries.</p>	<p>Comment noted.</p>
<p>Dental caries is not a consequence of lifelong exposure to bad diets, but a multifactorial disease with diet as one of its risk factors. Furthermore, it is not the lifelong exposure to dietary risk factors that lead to disease prevalence/severity, but the irreversible nature of the disease after cavitation and the way we measure disease including sequelae (restorations and extractions).</p>	<p>Comment noted.</p>

<p>There have been continuous improvements in dental caries at all, ages including adults. Of particular relevance is the vastly improved record of adults under the age of 35, who will have had access to fluoride toothpaste throughout their lives which seems to convey particularly high levels of protection. About 70% of these adults are free of evidence of dental decay, despite other evidence, from gum bleeding, to suggest that only about half of adults are cleaning their teeth sufficiently.</p>	<p>The prevalence and severity of dental caries have indeed decreased in the past decades, in particular in children. However, it is still common and is increasing significantly with age as it tracks from childhood to adulthood. As noted in the systematic review by Moynihan and Kelly (2014), there are studies that support the protective role of fluoride as the most important factor that has led to a decline in dental caries in Northern Europe, North America and Australia. However, dental caries persists in these countries, especially in adults. Evidence from a number of studies (cited in the systematic review) shows that exposure to fluoride does not prevent nor eliminate dental caries, but delays the cavitation process and its progression in populations, and therefore, cavitation of the teeth still occurs but at a later age.</p>
<p>Tooth decay is the major cause of pain and suffering in children and continues into adulthood as a major source of loss of self-esteem and embarrassment in cases of severe tooth decay. In the UK around 31% of children starting school have visible tooth decay and this continues later on in the later years of childhood. The National Health Service in the UK spends around £2.25 billion on dental treatment a year and patients only pay £550 million of this. A reduction in free sugars to 5% would have a big impact on this expenditure.</p>	<p>Comment noted.</p>
<p>Regarding the systematic review on free sugars intake and dental caries, there is insufficient evidence to reach any conclusion on adults (two non-randomized, 3 observations (1 ecological, 2 cross-sectional). The evidence used for children was larger (1 non RCT and 50 observational studies). But of these 50, only the 8 cohort studies could provide some light on the causal effects of sugary products and dental caries. The other studies (20 ecological, 22 cross-section) have too many threats to their validity. This may explain why the considerable large number of studies showing null or negative effects. Thus, the statement: "Positive associations between free sugars consumption and dental caries were detected in all ages" is not enough to infer a preventable effect of limiting dental caries.</p>	<p>Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic review by Moynihan and Kelly (2014). These were discussed and agreed by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health in order to determine the scope of the review. The studies in children were considered appropriate for extrapolating to adults as the etiology of dental caries is the same in children and adults (although enamel of the primary dentition is softer and more vulnerable to demineralization by plaque acid). Although there were no cohort studies conducted in adults, data from all five studies of other study design in adults included in the systematic review detected a statistically significant positive relationship between dietary free sugars and levels of dental caries. The negative health effects of dental caries are cumulative, tracking from</p>

	childhood (permanent dentition) to adulthood. Any existing study limitations are noted in the systematic review by Moynihan and Kelly (2014) and were also addressed in the GRADE evidence profiles included in the guideline (Annex 1).
The term “non-cavitated” is preferable to “pre-cavitated,” because the latter is deterministic and denotes irreversibility and the former indicates preventability.	Comment noted.
The difference in caries experience between the low (25% energy) total sugars group in the study by Rugg-Gunn et al. (1984) was not significant; the increment in caries experience between the low and high sugars group in the study by Burt et al. (1988), similarly, did not reach significance. In the same study (Burt et al., 1988), total sugars intake was not significantly higher in the higher caries group, although ‘snack sugars’ intake was significantly higher in the higher caries group, suggesting an inconsistent relationship between caries experience and sugars intake in this study; and finally, the difference in sugars intake between low and high caries groups in the study by Steckslen-Blicks et al. (1986) reached significance in the 13-y old adolescents, but not the 8-y old children.	Results for each of these studies are summarized in the systematic review by Moynihan and Kelly (2014). Overall, studies show a positive association between sugars intake and dental caries.
The evidence shows that there is a clear dose-response relationship between sugar consumption and tooth decay in children and adults. Tooth decay is a major cause of pain and suffering in children, and its consequences track into adulthood as a major source of poor nutrition (e.g. difficulties in eating foods such as raw fruits and vegetables and meat), embarrassment and self-esteem.	Comment noted.
Studies have shown that there is no longer a relation between sugar intake and caries in Western countries.	The prevalence and severity of dental caries have indeed decreased in the past decades, in particular in children. However, it is still common and is increasing significantly with age as it tracks from childhood to adulthood. As noted in the systematic review by Moynihan and Kelly (2014), there are studies that support the protective role of fluoride as the most important factor that has led to a decline in dental caries in Northern Europe, North America, and Australia. However, dental caries persists in these countries, especially in adults. Evidence from a number of studies (cited in the

	systematic review) shows that exposure to fluoride does not prevent nor eliminate dental caries, but delays the cavitation process and its progression in populations, and therefore, cavitation of the teeth still occurs but at a later age.
Regarding dental caries, a reduction in free sugars to less than 5% would have a big impact both on both social costs and financial expenditures.	Comment noted.
It is also worth noting that lactose in milk is cariogenic when consumed frequently, as was shown by several reports on observations in baby's breastfed over longer periods.	Comment noted.
Worldwide, oral disease is the fourth most expensive disease to treat; dental caries affects most adults and 60-90% of schoolchildren, leading to millions of lost school days each year, and remains one of the most common chronic diseases.	Comment noted.
Regular oral hygiene, the use of fluoridated toothpaste and water fluoridation are low cost and easy to use. This should not be disregarded particularly as the WHO stated "that the treatment of caries is placing a heavy burden on health-care budgets in many countries".	Guidance on oral health is provided in other WHO documents related to oral health in details.
As noted by WHO, the average 12 year old has a low risk of caries; however, by the time they are in their 30s, they have a higher level of caries in most of the world. This relationship is inverse to sugar consumption as children have reportedly higher sugar consumption than adults.	As noted in the systematic review and guideline, the etiology of dental caries is the same in children and adults (although enamel of the primary dentition is softer and more vulnerable to demineralization by plaque acid) and the negative health effects of dental caries are cumulative, tracking from childhood (permanent dentition) to adulthood.
The linear relationship observed was between dental caries in children and crude sugar intake data that was not directly measured from the children surveyed but a rough estimation of sugar availability for the entire country. Under such circumstances, there is no basis to establish any direct cause-effect association, let alone the "strong dose-response".	Study limitations inherent to ecological studies were noted in the systematic review by Moynihan and Kelly (2014) and were also addressed in the GRADE evidence profiles included in the guideline (Annex 1). Evidence was downgraded as necessary in response to the study limitations.

<p>Dental caries is not only prevalent among NCDs, it is the most prevalent of all 291 conditions assessed in the recent Global Burden of Disease study (Marcenes et al. 2013). Dental caries affects people's life directly and not only through tooth loss. Studies show that dental caries and its associated pain affect school attendance and performance, body weight, growth and quality of life in children. In addition to physical pain and suffering, tooth loss can lead to social stigmatization.</p>	<p>The reference to the effect of dental caries on children's school attendance and performance is included in the "Background" section of the guideline.</p>
<p>Data from the WHO Global Oral Health database as well as from the OECD database with indicators on dental caries trend, indicate a decline in caries prevalence and severity in countries with the current sugar supplies which have not gone down. For example, the average number of decayed, missing or filled teeth amongst 12 year old children has fallen from 4.7 to 1.6 teeth between 1980 and 2006, despite stable sugars supply and consumption. Similarly, sugars intake in the U.S. has increased over the last several decades while the prevalence of dental caries assessed in the NHANES database has declined. A distinct improvement in oral health status is also seen in Germany. Therefore, the association of free sugars consumption, in particular a single food product such as sugar-sweetened beverages, and dental caries is not supported by scientific evidence.</p>	<p>The prevalence and severity of dental caries have indeed decreased in the past decades, in particular in children. However, it is still common and is increasing significantly with age as it tracks from childhood to adulthood. As noted in the systematic review by Moynihan and Kelly (2014), there are studies supporting the protective role of fluoride as the most important factor that has led to a decline in dental caries in Northern Europe, North America and Australia. However, dental caries persists in these countries, especially in adults. Evidence from a number of studies (cited in the systematic review) shows that exposure to fluoride does not completely prevent nor eliminate dental caries, but delays the cavitation process and its progression in populations, and therefore, cavitation of the teeth still occurs but at a later age. Thus, reducing free sugars intake is considered to be an effective strategy to reduce the risk of dental caries.</p>
<p>A link is made between sugar-sweetened beverages and dental caries, however, sugar-free beverages are not risk free (i.e. enamel erosion, displacement of nutrient dense foods). The guideline should address this so that national recommendations as well as industries' action will not encourage the production of 'diet' products that are made with artificial sweeteners.</p>	<p>The evidence review did not include non-sugar sweeteners as an exposure, so the systematic review did not include any studies which may have examined the effects of non-sugar sweeteners intake on dental caries. It is, therefore, not possible for the guideline to provide guidance related to the effect of non-sugar sweeteners intake on dental caries.</p>
<p>The economic costs of dental diseases seem really overstated by orders of magnitude. The references for these estimates are not easily accessed and seem to be based on work done over a decade ago and is based on applying costs of restorative dentistry versus applying highly cost-effective fluoridation programmes. Since the focus on the guidance is on dental caries, only those costs should be used in estimates provided.</p>	<p>The data on expenditures to treat dental caries are approximate, taken from cited sources including a systematic analysis on a global burden of oral conditions published in 2013 and accurately reflect the fact that dental caries is an expensive disease to treat.</p>

<p>With respect to dental health, studies conducted in several countries looking at the intake of dairy products on the prevalence or risk of dental caries in children have found either a beneficial effect or no adverse effect of dairy products including those that are sweetened. Milk and milk products contain nutrients that have been shown to have anticariogenic properties including calcium, phosphate, casein and lipids.</p>	<p>Sugars naturally present in milk is not considered part of free sugars and therefore, is not included in the recommendations of this guideline.</p>
<p>There is no scientific rationale for the “conditional recommendation” to reduce intake of free sugars to below 5% of total energy and should thus be removed from the final guidance.</p>	<p>Information on how the recommendation for suggesting a further reduction of the intake of free sugars to below 5% of total energy intake was developed is described in detail in the guideline. In addition, all the studies reviewed and how the evidence was evaluated are described in the respective systematic reviews as well as in the relevant sections in the guidelines, including the GRADE evidence profiles included in the guideline (Annex 1). WHO issues conditional recommendations even when the quality of evidence may not be strong on the issues related to public health importance. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country’s context.</p>
<p>Outlining how free sugars contribute to weight gain through increasing the overall energy density of diets, as well as overall energy intake, particularly in the form of sugar-sweetened beverages, provides a clear picture of how free sugars increase the risk of NCDs.</p>	<p>Comment noted.</p>
<p>Although the guideline highlights obesity as being an independent risk factor for many NCDs, it omits being “overweight” as another important independent risk factor. Therefore, we urge the WHO to include being overweight, in addition to obesity, as a risk factor for NCDs.</p>	<p>The terms, overweight, obesity and unhealthy weight gain, are being used in the guideline to describe both overweight and obesity. In order to enhance the readability of some texts, only the term, “obesity”, may be used in some sentences. However, we have defined overweight and obesity where they first appeared in the guideline to indicate that we are referring to both overweight and obesity.</p>
<p>We support that the recommendations focus on the effect of consumption of free sugars (and not intrinsic sugars and sugars from milk). Fruit and</p>	<p>Comment noted.</p>

<p>vegetables, containing intrinsic sugars, are an important component of a healthy diet and can help in maintaining a healthy body weight, and both fruit and vegetables are important for cancer prevention.</p>	
<p>We welcome the very clear definition of “free sugars” and the inclusion of “sugars naturally present in honey, syrups and fruit juices” in it. We believe that there is a general lack of awareness regarding the consumption of these “natural free sugars” and the risk associated with their high intake. Therefore, we request active promotion of this guideline to improve consumer awareness.</p>	<p>Comment noted.</p>
<p>We support the focus on the impact of free sugars intake on obesity as obesity is an increasing global public health problem and is an important risk factor for increased risk of type 2 diabetes, cardiovascular diseases, cancer and other conditions. We also support the focus on the impact of free sugars intake on dental caries as dental caries is also of public health concern, despite the improvements in dental health and as well as the pain and expense of treating dental caries, tooth loss and poor oral health can be barriers to consuming a varied diet, particularly in older adults.</p>	<p>Comment noted.</p>
<p>We applaud WHO on the systematic and transparent approach it has taken to developing the guidelines, particularly in its adoption of the highly robust and transparent GRADE system. We strongly support the developmental target towards a further reduction in intake level of free sugars to less than 5%.</p>	<p>Comment noted.</p>
<p>The wording of the recommendation should reflect that of existing guidance: i.e. free sugars intake should be less than 10% of total energy intake, rather than not exceed 10%.</p>	<p>In consultation with the Guideline Review Committee, the wording of the recommendation has been modified as “In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake” in order to clarify the meaning of the recommendation.</p>
<p>No recommendation was provided in terms of an appropriate percentage of energy intake for sugars to prevent weight gain.</p>	<p>The guideline notes the importance of energy balance for avoiding unhealthy weight gain and also notes that increasing or decreasing free sugars is associated with parallel changes in body weight and the relationship is present regardless of the level of intake of free sugars. Therefore, the</p>

	<p>guideline recommends a reduced intake of free sugars throughout the lifecourse and in both adults and children. It is also recommended to reduce the intake of free sugars to less than 10% of total energy intake. For further health benefits, it is suggested a further reduction of the intake of free sugars to below 5% of total energy intake</p>
<p>The distinction between strong and conditional recommendations, regarding the level of evidence and other relevant factors used in determining the strength, is not sufficiently clear and may cause confusion when it comes to applying the recommendations. Specifically, although the 5% recommendation is conditional, it may not be clear that it is conditional and therefore, that there is greater uncertainty regarding the quality of evidence, as well as the balance of benefits versus harms and burdens. In short, some may mistake all three recommendations as being of equal weight.</p>	<p>Clear definitions of strong and conditional recommendations are included in the guideline as well as references to the WHO handbook for guideline development (2014), which contains further information. In addition, WHO has prepared an information note to accompany the guideline which describes these in simpler language to help facilitate the understanding of the strong and conditional recommendations.</p>
<p>It would be helpful to understand more about the process used by WHO to determine recommendations and the basis for their classification. Specifically clarification on the association between strength of recommendation and quality of evidence. Also, it would be helpful to know whether 'very low' quality evidence is generally considered sufficient to support recommendations and how this compares to the level of evidence that supports other public health recommendations by WHO and other national or international bodies.</p>	<p>As noted in the guideline, the quality of evidence is one factor, though an important factor, to be considered when determining the strength of a recommendation using GRADE methodology. These include values and preferences, trade-off between benefits and harm, and costs and feasibility. These are all described in the guideline and further information on the WHO guideline development process can also be found in the WHO handbook for guideline development (2014). WHO does issue conditional recommendations even when the quality of evidence may not be strong on issues of public health importance. There are many examples of WHO guidelines in various areas of work which contain conditional recommendations developed from low or very low quality of evidence. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country's context.</p>

<p>Regarding the recommendation to reduced intake of free sugars throughout the lifecourse, it would be useful to have some more context for this recommendation in order to determine how it should be applied in practice; for example, from what initial level should intake be reduced, whether it applies equally to populations with higher and lower intakes, any threshold beneath which this would not apply and whether or not the source of the free sugars need to be considered. Without this information, there may be problems when setting targets in planning public health nutrition programs.</p>	<p>The recommendation is to reduce the intake of free sugars throughout the lifecourse regardless of the levels of consumption at present. The guideline, therefore, notes that levels should not be increased in countries that currently have a low intake of free sugars, i.e. below 10% of total energy.</p>
<p>There is a need for substantial debate and involvement of stakeholders before these recommendations can be adopted as policy.</p>	<p>How the recommendations are translated and implemented will vary from country to country and individual to individual in accordance with respective context. Guidance on how the recommendations can be translated and implemented is provided in the "Translation and implementation" and includes examples of measures and interventions which are already being implemented by different countries.</p>
<p>Evidence for recommendations should be of the highest quality and representative of the majority of populations. Evidence rated as 'moderate' to 'very low' does not meet these conditions.</p>	<p>As noted in the guideline, the quality of evidence is one factor, though an important factor, to be considered when determining the strength of a recommendation using GRADE methodology. These include values and preferences, trade-off between benefits and harm, and costs and feasibility. These are all described in the guideline and further information on the WHO guideline development process can also be found in the WHO handbook for guideline development (2014). WHO does issue conditional recommendations even when the quality of evidence may not be strong on issues of public health importance. There are many examples of WHO guidelines in various areas of work which contain conditional recommendations developed from low or very low quality of evidence. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country's context.</p>

<p>There is an opportunity cost of implementing conditional recommendations with limited evidence, i.e. there are fewer resources available to implementing other, strong recommendations with a stronger evidence base.</p>	<p>How the recommendations are translated and implemented will vary from country to country and individual to individual in accordance with respective context. Guidance on how the recommendations can be translated and implemented is provided in the "Translation and implementation" and includes examples of measures and interventions which are already being implemented by different countries.</p>
<p>Further research on the benefits of reducing intake of free sugars to below 5% of total energy is needed, so that this recommendation can be classified as 'strong' when the guideline is revised in 2020.</p>	<p>Comment noted.</p>
<p>The recommendation to reduce sugar intake to 5% or less of total energy intake should be changed from "conditional" to "strong". The recommendation should not be "downgraded" on the basis of only having ecological evidence. Sugars have been known for several decades to be the unique causative factors. The usual great caution associated with ecological analyses is appropriate when one has several confounding causal or major potential modifying factors, but there are none in relation to dental caries: when sugars intake in a region, or country are negligible caries is practically non-existent even in octogenarians who have been exposed to the dietary sugar intakes for many decades. For example, people of all ages on diets low in sugars, such as in Nigeria in the 1960s, had negligible dental caries (98% of all ages being completely free of caries) despite having poor hygiene and many variables considered to be confounders of dental problems in general. Furthermore, there are no known harms in reducing intake to less than 5% and there is little uncertainty about the four factors used in determining the strength of recommendations.</p>	<p>The decision to make the recommendation related to the reduction of the intake of free sugars to below 5% "conditional" was based on various considerations described in Annex 7 of the guideline. These include quality of evidence, values and preferences, trade-off between benefits and harm, and costs and feasibility.</p>
<p>Further justification to support a change in the classification from "conditional" to "strong" includes the scientific statement published by the American Heart Association in 2009 on dietary sugars and cardiovascular health. Building on the 2005 United States Dietary Guidelines, the AHA outlined recommendations for reduced intake of added sugars approximating 5% of total energy.</p>	<p>Comment noted.</p>

<p>In its 2011 publication "Diet, Physical Activity and Cardiovascular Disease Prevention in Europe", the European Heart Network (EHN) proposed a goal of 5% of energy. EHN also proposed a separate goal on sugar-sweetened drinks to reduce the intake and, in the longer term, aim at a zero consumption of sugar-sweetened drinks.</p>	<p>Comment noted.</p>
<p>There is no dietary or nutrition requirement for free sugars nor evidence that any level of free sugars intake is beneficial. Though the "Background" section highlights the importance of reducing the current high levels of free sugars in the diet, it does not emphasise the fact that free or added sugars are not a normal part of the human diet. Free sugars have only recently been added to our diets (predominantly to processed food and drink), since extracting sugar from cane, beet, and enzymatically converting corn syrup made it cheap and widely available.</p>	<p>Comment noted.</p>
<p>A recommendation to reduce free sugar intakes to less than 5% of dietary energy would provide a major driver to help reduce caloric intakes at the population level. This would help to prevent and reduce levels of overweight, obesity and associated type 2 diabetes and NCDs.</p>	<p>Comment noted.</p>
<p>It would be useful to know why the 10% level was set in 1989 and 2002, and whether further evidence supporting this level has become available since then.</p>	<p>Detailed background information and evidence reviews conducted by the 1989 WHO Study Group and the 2002 WHO/FAO Expert Consultations can be found in their respective reports, i.e. TRS 797 (1990) and TRS 916 (2003).</p>
<p>In the past, the WHO TRS 916 report of 2003 recommended the target of less than 10% energy for free sugars, but at the same time acknowledged that the basis for this target was controversial. These earlier comments are still valid for this new draft guideline, which suggests reconfirming the 10% energy target for free sugars.</p>	<p>Since the WHO/FAO Expert Consultation was held in 2002, more studies have become available as noted in the background systematic reviews and based on the currently available evidence, the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health determined that the evidence for reducing the intake of free sugars to less than 10% of total energy intake warranted a strong recommendation.</p>
<p>The quantitative population targets proposed in the Draft Guideline follow the same flawed logic, based on unreliable evidence, as previous Expert Consultation Reports: WHO TRS 797 (1989) and WHO TRS 916 (2003).</p>	<p>WHO guidelines are developed through a robust and transparent guideline development process guided by the WHO handbook for guideline development (2014). Inclusion and exclusion criteria used in selecting studies were guided by the PICO questions which are described in detail in Annex 6 of the guideline, and in the systematic</p>

	<p>reviews by Te Morenga et al. (2013) and Moynihan and Kelly (2014). These were discussed and agreed by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health in order to determine the scope of the systematic reviews, both of which were published in peer-review scientific journals after thorough review. Based on the evidence provided through these systematic reviews, the recommendations of this guideline were developed.</p>
<p>Total energy intake should be clarified as to whether or not it refers to the total daily energy intake needed for a person of a certain sex and age (i.e. general recommendation on energy needs) or an individual's energy intake.</p>	<p>Total energy intake refers to the energy needed by a person of a certain sex and age to maintain energy balance. This is also described in detail in the guideline.</p>
<p>It would be helpful to note if there is evidence that consumption of free sugars at a level >10% energy is associated with fewer satiety clues and hence a positive energy balance that is not really noticed by the consumer and/or if this level of sugar intake typical for a high-sugar, high-fat diet, and associated with increased risk of overweight and obesity and other NCDs.</p>	<p>As these questions were not among the original PICO questions (Annex 6) which were developed by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health, searches for studies supporting these possible associations were not conducted.</p>
<p>Although the evidence supporting the recommendations is sound, if doubts are cast on the evidence, the precautionary principle should be taken into account in order to best protect public health.</p>	<p>Comment noted.</p>
<p>It is stated that the guidance is to be used to develop a strategy to “reformulate food products and in particular processed foods that are high in sugars”. In replacing free sugars, it is likely that manufacturers will use a combination of other bulk sweeteners and carbohydrates with the same or similar calorific values. Given the lack of evidence for weight loss from isoenergetic switches, emphasis on a requirement for overall calorie reduction in the reformulated foods should be considered.</p>	<p>Information on how the recommendations can be implemented and translated into action is noted in the “Translation and implementation” section of the guideline, including examples of measures and interventions which are already being implemented by countries. Development of a strategy to reformulate food products, in particular processed foods that are high in free sugars is one of such measures. WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic action in accordance with respective countries’ context, as appropriate.</p>
<p>The recommendation to reduce sugars intake to less than 5% of total energy intake would be in conflict with other authoritative sources of dietary advice that require much higher grade scientific</p>	<p>WHO conducts an independent review of the evidence following the WHO guideline development process as outlined in the WHO handbook for guideline development (2014), which</p>

<p>evidence than that quoted in support of the proposed WHO 5% guideline.</p>	<p>includes rating the quality of evidence using GRADE methodology. As far as the recommendation on a further reduction of the intake of free sugars to below 5% of total energy intake is concerned, the current perspectives of other organizations providing dietary advice are in fact in line with the WHO recommendations, including the American Heart Association, the European Heart Network and the UK Scientific Advisory Committee on Nutrition (draft report) which was issued for public consultation in May 2014 and is currently being finalized.</p>
<p>The recommendation to reduce sugars intake to less than 5% of total energy intake would place WHO in the position of being pressured to use a similar "low bar" of evidence when reviewing guidelines and would undermine the pre-eminence of WHO as the trusted custodian of global health policy.</p>	<p>As noted in the guideline, the quality of evidence is one factor, though an important factor, to be considered when determining the strength of a recommendation using GRADE methodology. These include values and preferences, trade-off between benefits and harm, and costs and feasibility. These are all described in the guideline and further information on the WHO guideline development process can also be found in the WHO handbook for guideline development (2014). WHO does issue conditional recommendations even when the quality of evidence may not be strong on issues of public health importance. There are many examples of WHO guidelines in various areas of work which contain conditional recommendations developed from low or very low quality of evidence. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country's context.</p>
<p>The recommendations reflect appropriate translation of the evidence presented and are highly defensible and justifiable from a scientific standpoint. In support of the recommendations, modelling studies that helped inform quantitative recommendations in the Australian Dietary Guidelines 2013, demonstrated that, for the smallest (or in the case of children, the youngest) and least active people in each age/gender group modelled, there was little room for any discretionary foods and drinks (those that are not a necessary part of healthy dietary patterns and are high in saturated fat, added sugar, added salt</p>	<p>Comment noted.</p>

<p>and/or alcohol) to be consumed within energy requirements.</p>	
<p>The guidelines should provide supplementary and parallel recommendations on availability and/or consumption of sugar at the macro-level. Many countries do not yet have regular diet and nutrition surveys which can reliably monitor food and nutrient intakes in the population. Establishing per capita consumption targets will allow countries to begin to develop and monitor the impact of policies straight away. These per capita targets could be in line with the levels associated with the evidence on dental caries and sugar consumption. It would be good to provide an idea of the current sugar intake levels in different parts of the world, including average intake ranges as well as examples of high and low intakes.</p>	<p>Setting up the targets on per capita intake of free sugars for countries is beyond the scope of this guideline. Efforts are currently being made to compile available data and information on free sugars intake in different countries.</p>
<p>We fully support WHO’s commitment to evidence-based policy making to help ensure that guidelines produced are free from bias, meet a public health need and are consistent with principles that include a comprehensive and objective assessment of the best available evidence and clear process used to develop the recommendations in accordance with the WHO handbook for guideline development.</p>	<p>Comment noted.</p>
<p>WHO’s efforts to reduce intakes of refined sugars were stridently opposed by commercial vested interests previously. We urge WHO to continue to maintain its vigilance in order to minimise the negative effects of Conflicts of Interests.</p>	<p>Comment noted.</p>
<p>Against the background of the strong increase in NCDs globally – and even faster in low- and middle-income countries – this new WHO guideline is very timely. Consumption of free sugars contributes to poor diets and overweight, and is an important risk factor for NCDs. Governments are under pressure, from industry lobbying and provisions in trade and investment treaties, which limits their policy space. Therefore, these guidelines provide an important opportunity to assist and support governments in taking effective policy measures to further reduce sugars intake, in the context of creating an overall healthy environment, to promote healthy diets and discourage unhealthy choices. We strongly</p>	<p>Information on how the recommendations can be implemented and translated into action is noted in the “Translation and implementation” section of the guideline, which includes some examples of measures and interventions that are already being implemented by countries, such as food and nutrition labelling, regulation of marketing of foods and non-alcoholic beverages that are high in free sugars, and fiscal policies targeting foods and beverages that are high in free sugars. WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic actions in accordance with respective countries’ context, as</p>

<p>support the recommendation for a reduced intake of free sugars to below 5% of total energy. We would also like to see an extension of the recommendations on how the guidelines can be used by policy planners, to include policies on economic and fiscal measures, such as food taxes, marketing restrictions of foods high in sugar, saturated fat and salt as well as development of national dietary guidelines.</p>	<p>appropriate.</p>
<p>The impacts on sugar producing countries should be explored by FAO with support provided to low- and middle-income countries, farmers and producers who rely on sugar production as a major source of income. This should include diversifying from sugar production to producing other plant-based foods of public health benefit owing to their relative nutrient density, such as fruit, vegetables, nuts, pulses and whole grains.</p>	<p>Comment noted.</p>
<p>Public health advice relating to dental caries and obesity should emphasise regular exposure to fluoride and the benefits of a varied diet that meets, but does not exceed, energy requirements.</p>	<p>Comment noted.</p>
<p>People’s palates can adapt to a preference for less sweet tastes as a result of gradual reductions. This has been demonstrated by successful salt reduction initiatives around the world as well changes in preference from sweetened to sugar-free tea and coffee.</p>	<p>Comment noted.</p>
<p>The consumption of added sugars by infants and young children can lead to the imprinting of a taste preference for sweet, energy-dense, highly processed and high sugar foods in later life. We are especially concerned with the negative impact that the marketing of food products with added sugars, trans-fatty acids and salt has on traditional food patterns and cultures in low- and middle-income countries. The marketing tactics used by the baby food products industry presents such foods as being healthier than family foods, mislead and distorts the perception of parents, health workers and also general public regarding normal healthy food. WHO undertake a number of actions including increasing its support to Member States to regulate the marketing of feeding products for infants and young children as per the International Code of Marketing of Breastmilk Substitutes and subsequent relevant WHA</p>	<p>The World Health Assembly in 2010 endorsed a set of recommendations on the marketing of foods and non-alcoholic beverages to children (resolution WHA63.14). As part of the efforts in implementing the recommendations, WHO is developing a nutrient profile model which is guided by WHO guidelines including the guideline on sugars intake in order to ensure coherence in the principles applied and guidance WHO provides. WHO is also actively engaged in supporting Member States in the implementation of the International Code of Marketing of Breastmilk Substitutes and subsequent relevant WHA resolutions in order to protect, promote and support breastfeeding and ensure appropriate complementary feeding practices.</p>

<p>resolutions, as well as to implement the Set of recommendations on the marketing of foods and non-alcoholic beverages to children.</p>	
<p>WHO should recommend an opening up of the Codex standard on cereal-based foods to reduce sugar levels.</p>	<p>Comment noted.</p>
<p>No evidence is provided to support the statement, "Because there is no evidence of adverse effects of consumption of intrinsic sugars, recommendations focus on the effect of consumption of free sugars". Intrinsic sugars, if consumed in excess, contribute calories and can contribute to weight gain.</p>	<p>Review of the literature did not identify any reports of adverse health effects of consuming intrinsic sugars. The statement is, therefore, modified as "... there is no reported evidence of adverse effects ..." in the final guideline.</p>
<p>Why are intrinsic sugars from fruit juice and fruit concentrate considered free sugar, whereas intrinsic sugars from intact fruit and vegetables are not? And why would intrinsic sugar not have the same negative health impact as free sugar? Does the lack of evidence on a negative impact of intrinsic sugar mean that this has not been studied, rather than that it has been proven not to have a negative impact?</p>	<p>Intrinsic sugars are those sugars forming an integral part of certain unprocessed foodstuffs that is enclosed within the cell wall, and are present in whole fruit and vegetables. But when fruits are squeezed to make fruit juice, the cell wall is disrupted and sugars are taken out of their natural cellular environment in fruit. Review of the literature did not identify any studies on adverse health effects of consuming intrinsic sugars. The statement is, therefore, modified as "... there is no reported evidence of adverse effects " in the final guideline.</p>
<p>Since the objective of this guideline is to provide recommendations on the consumption of only free sugars, it may be prudent to add the term free sugars in the title of the guideline. It would also be sensible to define the term free sugars in the background section.</p>	<p>The definition of "free sugars" has been added in the "Scope and purpose" section of the final guideline to clarify the focus of the guideline.</p>
<p>When there is a lack of evidence, in accordance with the WHO handbook for guideline development it may be appropriate to state that "No recommendation can be made because of insufficient evidence".</p>	<p>There wasn't insufficient evidence in the case of body weight or dental caries. Given the nature of some of the studies included in the analyses not all of the evidence was of high quality; however, it was considered by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health to be the best available evidence for answering the particular research questions. WHO issues conditional recommendations even when the quality of evidence may not be strong on issues of public health importance. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder</p>

	<p>dialogue and consultations are needed before the recommendation is implemented as policy in each country's context. These are described in details both in the guideline and in the WHO handbook for guideline development (2014).</p>
<p>The recommendation to reduce sugar intake to 5% or less of total energy intake is based on ecological studies of Japanese children with a low exposure to fluoride conducted during World War II. Ecological studies provide no evidence for causal relationships and these particular studies were conducted on a unique population at a unique period of time (e.g. various social, psychosocial, economic and emotional pressures as a result of war, and lack of water fluoridation, fluoridated toothpastes, and dental sealants). Further, changes in per capita sugar availability do not reliably predict the magnitude or the direction of change in dental caries prevalence. Results of these studies may therefore have very limited general applicability. The evidence from these studies is very weak and the authors of the systematic review themselves acknowledge that the evidence is of "very low quality".</p>	<p>While the factors noted in the comments may lessen the confidence in the results obtained from the studies, they do not preclude their use in informing recommendations and that was the decision of the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health. Any existing study limitations were noted in the systematic review by Moynihan and Kelly (2014) and were also addressed in the GRADE evidence profiles included in the guideline (Annex 1). Evidence was downgraded as necessary in response to the study limitations. WHO issues conditional recommendations even when the quality of evidence may not be strong on issues related of public health importance. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country's context.</p>
<p>The population studies conducted in Japan were cited previously, in earlier WHO guidance, however they did not warrant a recommendation to reduce sugars intake to 5% or less of total energy at that time.</p>	<p>The current recommendations are based in part on a re-analysis of the studies conducted in Japan based on knowledge gained in recent years.</p>
<p>In the study by Burt et al. (1988) sugars intake was well above 10% of total energy intake, and thus does not support the recommendation to limit sugar intake to 10% or less of total energy.</p>	<p>This study was not used to formulate the recommendation to limit sugar intake to 10% or less of total energy.</p>
<p>The adverse effects of consumption of intrinsic sugar for diabetic patients should also be highlighted.</p>	<p>There was no reported evidence of adverse effects of consumption of intrinsic sugars.</p>

<p>It is not clear whether sugars naturally contained in milk should be included in these limits of the recommendations (i.e. less than 10% and 5%) or not.</p>	<p>The recommendations of this guideline focus on the effect of free sugars, not sugars naturally present in milk. Free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. This is also described in the “Background” section of the guideline.</p>
<p>This draft recommendation highlights sugar-sweetened beverages in particular as a principal contributor to the development of obesity and dental caries in the population. There is no scientific evidence to support the unequal treatment given to sugar-sweetened beverages in comparison with other foods and beverages. The most important consideration for overweight and obesity is energy balance and this phenomenon cannot be attributed to one particular food or type of food, such as sugar-sweetened beverages. A total diet approach is recommended for healthy eating, and consumption of sugar-sweetened beverages should be planned in the context of total calorie intake and how they can fit into the total diet of each individual.</p>	<p>The recommendations of the guideline are related to free sugars, not sugar-sweetened beverages although sugar-sweetened beverages were included as one of the exposures when undertaking the systematic reviews given their contributions to the free sugars intake among various population groups. Sugar-sweetened beverages contain free sugars among their ingredients and many studies have been conducted with sugar-sweetened beverages as an intervention/exposure. Detailed information on the evidence reviews are provided in the systematic reviews as well as in the guideline in a summary form including the GRADE evidence profiles included in the guideline (Annex 1).</p>
<p>The point should be made that consumption of sugars, particularly in liquid form, has no impact on satiety (due to the rapid spikes and drops in blood sugar) and in many cases leads to increased hunger and cravings. The consumption of sugar-sweetened beverages adds to the calories individuals consume, rather than replacing them.</p>	<p>Comment noted.</p>
<p>The guideline should also highlight that increased consumption of sugar-sweetened beverages may increase micronutrient deficiencies in children, compromising their growth and development.</p>	<p>Comment noted.</p>
<p>The studies included in the meta-analyses on body weight and dental caries include those with different types of sugars exposure/intervention (e.g. total sugars, free sugars, added sugars, etc.) and it seems that the majority of studies cited in the analysis do not consider “free sugars” specifically. However, this evidence was used to inform recommendations specifically for free sugars.</p>	<p>During the initial scoping of the guideline, it was decided to review the literature to identify studies not only of free sugars but also more broadly of total sugars. As a result, some studies assessing total sugars were initially identified in addition to those assessing free sugars. Regarding the studies actually included in the systematic review and meta-analyses, all of the studies for body weight assessed free sugars intake (either through free sugars containing foods or sugar-sweetened beverages). Of those studies included in the GRADE</p>

	<p>analysis assessing the effect of reducing or increasing free sugars intake on dental caries, six measured free sugars directly, one measured free sugars retrospectively (Rugg-Gunn et al. [1984]) and one measured total sugars (Burt et al. [1988]). Based on evidence from Rugg-Gunn et al. it was considered that the total sugars measured in the Burt et al. study were representative of free sugars intake. Detailed consideration of this assessment is provided in the footnotes of the relevant GRADE evidence profile (Annex 1) in the guideline. Regarding the GRADE analysis for the 10% threshold, one study measured free sugars retrospectively (Rugg-Gunn et al. [1984]); all others measured free sugars directly. The studies included in the GRADE analysis for the 5% threshold all measured per capita availability of sucrose only, and it is considered that at the time the data was collected for the studies, sucrose was the primary source of free sugars in the diet in the population being studied.</p>
<p>The term “sugars” should also include artificial sweeteners, such as aspartame.</p>	<p>Non-sugar sweeteners were not included as an exposure when determining the scope of the guideline.</p>
<p>Research suggests that artificial sweeteners may also lead to weight gain by stimulating the appetite without meeting the body’s demand for calories. It would be helpful to clarify that the recommendations do not advocate for an increased reliance on artificial sweeteners as a sugars substitute.</p>	<p>Non-sugar sweeteners were not included as an exposure when determining the scope of the guideline and thus no evidence was collected that would allow assessment of non-sugar sweeteners and body weight.</p>
<p>It is appropriate to recommend a general reduction of sugars intake in combination with an active lifestyle throughout the lifecourse to reach a healthy body weight. In this context, the guideline recommending that free sugars intake should not exceed 10% of total daily energy intake is highly useful for the purpose of nutritional guidance and is eminently practical for the correct implementation of public policy in Member States.</p>	<p>Comment noted.</p>
<p>WHO excludes sugars from milk in its recommendation. In soy drinks, sugars are added to meet a consumer-friendly taste. However, even after this addition, soy drinks have a lower sugars content compared to dairy milk. Sugars naturally present in milk or sugars added to soy drinks are absorbed in the body in a similar way, provide the</p>	<p>As noted in the guideline, there is no reported evidence of adverse effects of consumption of intrinsic sugars and sugars naturally present in milk. The recommendations of the guideline focus on the effect of free sugars intake and sugars added to soy drinks fall under the definition of “free sugars”.</p>

<p>same energy and should therefore be treated equally in recommendations.</p>	
<p>No evidence was presented that reducing the intake of free sugars to less than 5% of total energy intake results in no harm. There is inadequate evidence of the health consequences of reducing free sugars intake to this level in populations that previously experienced higher intakes. It cannot be determined by observation that there is no harm to morbidity or mortality associated with a low sugars intake.</p>	<p>Review of the literature did not identify any reports on adverse health effects of consuming free sugars at a level of less than 5% of total energy intake. Therefore, in the final guideline, the statement has been modified as “No evidence for harm associated with reducing the intake of free sugars to less than 5% of total energy intake was identified” to accurately reflect the assessment.</p>
<p>Countries that currently exhibit low intakes of free sugars (i.e. less than 5% of total energy intake) are mainly under-developed and do not enjoy the health experience or longevity of industrialised countries. Thus a low intake of sugars is confounded, in epidemiological comparisons, with economic underdevelopment and its consequent health implications.</p>	<p>Low- and middle-income countries are going through both nutrition transition (i.e. dietary change which is shifting the structure of the diet toward a higher energy density with a greater role of free sugars and fats) and epidemiological transition. As stated in the 2014 NCD Global Status Report, almost three quarters of all NCD deaths (28 million), and the majority of premature deaths (82%) occurred in low- and middle-income countries.</p>
<p>The guideline should focus on healthy diet, rather than only focusing on sugars intake and obesity (and subsequent NCDs) when in fact, a person can be at a healthy weight yet consuming a diet that lacks many key nutrients due to high intake of sugars and sugar-sweetened food products.</p>	<p>WHO also provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work. The sugars guideline is a nutrient guideline which then needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at country level. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline.</p>
<p>The impact of different sugar containing foods on the glycemic response needs to be considered.</p>	<p>Comment noted.</p>
<p>The guideline would benefit from quantification of the 10% and 5% threshold recommendations by giving specific examples and quantities of foods and beverages.</p>	<p>Comment noted.</p>
<p>It is not only “free sugars”, but total sugars intake which is a problem. The addition of a comment in the conclusion that both “free sugars” and total sugars from all sources should be consumed in moderation would be welcomed.</p>	<p>The guideline provides recommendations specifically on free sugars intake.</p>

<p>The attack on sugars, without specifying that obesity problems could arise from excessive intake of any food, is unscientific. It is known that both the international recommendation as well as the recommendation of the Italian government say that in order to have a balanced diet, you must consume 60% complex carbohydrates, of which at least 10% is composed of simple sugars, namely glucose, fructose and sucrose. The consumption of fructose and sucrose is now much reduced, but obesity continues to increase. Therefore, the obesity problem should not be attributed to an increasing intake of sugars, but rather it is due to the fat intake, especially saturated fat intake, and physical inactivity.</p>	<p>As noted by the comment, the population nutrient intake goals for the prevention of NCDs which was first developed by the 1989 WHO Study Group and was updated by the 2002 WHO/FAO Expert Consultation recommend the intake of total carbohydrate as 55 - 75% of total energy and out of which the intake of free sugars should be limited to less than 10% of total energy. Updating of the guidance on nutrient intake goals is part of the ongoing efforts of WHO to update existing dietary goals for the prevention of NCDs in order to reflect the latest scientific and medical knowledge in the way we updated the sodium and potassium guidelines in 2012. As noted in the guideline, this sugars guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet. In addition, comprehensive strategies to prevent and control NCDs (including obesity) are provided in the NCD Global Action Plan 2013 – 2020 which was endorsed by the World Health Assembly in 2013.</p>
<p>Reports of the 1989 WHO Study Group and 2002 WHO/FAO Expert Consultation that showed the association between high sugars intake and poor dietary quality, obesity and NCD, need to be updated.</p>	<p>WHO regularly updates its guidelines and recommendations to reflect the latest scientific and medical knowledge and updating of this guideline is part of such ongoing efforts of WHO to update existing dietary goals for the prevention of NCDs. Therefore, the recommendations in this guideline are the updates of the recommendations related to free sugars intake developed by the 1989 WHO Study Group and the 2002 WHO/FAO Expert Consultation.</p>
<p>The guideline contradicts other WHO recommendations to promote the consumption of fruit, which is the main natural source of fructose.</p>	<p>The guideline does not restrict the consumption of whole fruit and vegetables as sugars contained in whole fruit and vegetables are not free sugars.</p>
<p>The evidence base (in terms of published studies and reviews) is very large for both weight gain and dental caries in relation to sugars intake yet only a single review for each area was included in formulating the recommendations and the criteria for including the studies in the reviews are not reported. So a clear statement on the criteria should be included and the guidelines should capitalize on the most recent evidence supported by well conducted studies in relevant countries</p>	<p>The guideline was developed based on systematic reviews which reviewed approximately 17,300 published articles for weight gain and approximately 6,000 published articles for dental caries and further selected relevant studies in accordance with the PICO questions (Annex 6) which were developed by the WHO Nutrition Guidance Expert Advisory Group (NUGAG) Subgroup on Diet and Health. Detailed information regarding inclusion criteria and other</p>

<p>and children populations. The guideline should also ensure that the evidence provided by observational studies is put in the right context.</p>	<p>methodological parameters can be found in the systematic reviews themselves.</p>
<p>The evidence on the relationship between intake of added sugars and micronutrient intake has been thoroughly reviewed by other authorities and independent researchers, including the Institute of Medicine (IOM) and the European Food Safety Authority (EFSA), who have concluded that there is no consistent evidence of any reduction in micronutrient intake that arises from added sugars intake for the majority of consumers who consume less than 25% of their food energy from added sugars.</p>	<p>The 25% figure cited in the IOM report in 2002 was not a recommendation for a desirable or even acceptable sugar intake. It was a suggested maximum intake, however, based on the decreased intake of some micronutrients in American subpopulations, and was not related to weight gain or obesity nor to indicate dietary adequacy. The 25% figure was misinterpreted and misused by some, and was subsequently clarified by then the President of IOM.</p>
<p>Reduced intake of some micronutrients has been observed at very low and very high levels of sugars intake. The 2002 IOM report illustrates that those individuals who consume 5-10% of total energy as added sugars have higher micronutrient intakes than those who consume 0-5% of total energy as added sugars. In certain populations, optimal levels of some micronutrients occur with sugars intake in the range 10-15% of total energy intake.</p>	<p>The analysis in the IOM report utilized national survey data from 1988 - 1994 in the United States and from the review of the data, the statement that individuals who consume 5- 10% of total energy as added sugars have higher micronutrient intakes than those who consume 0- 5% of total energy as added sugars may not be the case for all micronutrients; in some cases (i.e. certain age groups and/or sex) the highest intake level of a particular micronutrient is found at added sugars consumption of less than 5% of total energy intake.</p>
<p>The notion that consumption of foods containing free sugars (particularly sugar-sweetened beverages) reduce consumption of nutrient-dense foods (and thus reduced intake of micronutrients) is overly simplistic. Relationships between macronutrient and micronutrient consumption are multifactorial and total diet – not single macronutrients – determines micronutrient adequacy.</p>	<p>WHO provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>A nutrient-dense diet rich in fruits, vegetables and grains leads to a consistent, stable body weight. Focusing on one or a few nutrients as a means to prevent and control weight gain, rather than looking at diets as a whole, may not be effective.</p>	<p>The sugars guideline is a nutrient guideline which then needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at country level. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline. The guideline also highlights the need to use it in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids in order to guide effective public health nutrition policies and programmes to</p>

	<p>promote a healthy diet. It is also stated that providing overall dietary guidance is beyond the scope of this guideline, because such guidance should be based on overall dietary goals that consider all required nutrients. WHO provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>Not focusing on whole diets risk that a sole and highly focused approach to sugars could be misinterpreted in two ways that might harm health: some will not understand the distinction between free sugars versus total sugar intake and may cut down on fruits and other natural sources of sugar with negative consequences for overall nutrient intake; and others might substitute fats and oils for sugars leading to no change of worsening overall nutrient status.</p>	<p>The sugars guideline is a nutrient guideline which then needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at country level. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline. The guideline also highlights the need to use it in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids in order to guide effective public health nutrition policies and programmes to promote a healthy diet. It is also stated that providing overall dietary guidance is beyond the scope of this guideline, because such guidance should be based on overall dietary goals that consider all required nutrients. WHO provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>If consumers were merely to replace salty and fatty foods with fruits and vegetables, their caloric consumption would be reduced, they would be satiated and not be driven to overeat. Body weight would naturally be reduced.</p>	<p>WHO provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work.</p>
<p>Sugar provides palatability that increases consumption, especially by children and adolescents, of many healthy foods (e.g. dairy, etc.) which is a positive factor in the intake of multiple essential micronutrients. This would argue against the assertion that reducing the intake of free sugars to less than 5% of total energy intake results in no harm.</p>	<p>Healthy foods are widely consumed without the addition of free sugars.</p>

<p>Regarding the remark that intake of free sugars to less than 5% of total energy intake results in no harm, there is evidence indicating that those who consume lower levels of sugars consumers tend to also consume higher levels of fat.</p>	<p>The guideline highlights the need to use it in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids in order to guide effective public health nutrition policies and programmes to promote a healthy diet.</p>
<p>Reducing free sugars intake to less than 5% of total energy may affect the ability to maintain adequate blood sugar in certain situations; for example ketotic hypoglycaemia is a form of substrate-limited hypoglycaemia that is a consequence of inadequate carbohydrate supply during prolonged periods between food ingestion, especially overnight, and can affect young children.</p>	<p>Generally, part of the treatment for ketotic hypoglycaemia in children is to provide a bedtime carbohydrate snack which can be accomplished under the current recommendations for free sugars intake. In addition, it is clearly stated in the "Remarks" section of the guideline that "These recommendations do not apply to individuals in need of therapeutic diets..."</p>
<p>Hydration might be unfavourably affected in some individual or age class by the restriction of free sugars intake (in the form of sugar sweetened drinks).</p>	<p>Adequate hydration can be achieved with liquids that do not contain or contain low levels of free sugars.</p>
<p>Reducing free sugars intake to less than 5% of total energy would not leave much room for sweetened nutritious foods such as chocolate milk and sweetened yogurts and would likely result in negative consequences on overall diet quality and health. This would also exacerbate the under-consumption of milk products which is already an issue in many countries including Canada, the U.S. and Australia. Milk products are an important source of several key nutrients and a growing body of scientific evidence has linked milk product consumption to several health benefits including healthy weight, dental health and reduction in the risk of several noncommunicable diseases.</p>	<p>Milk products are available without the addition of free sugars.</p>
<p>The role of portion size in weight gain is not considered. The guideline should promote healthy diet and lifestyles including the control of portion size to reduce the overall calorie intake.</p>	<p>In the "Translation and implementation" section of the guideline, some examples of how the recommendations of this guideline can be used by policy-makers, programme managers and other stakeholders are included. It is also stated that providing overall dietary guidance is beyond the scope of this guideline, because such guidance should be based on overall dietary goals that consider all required nutrients. WHO also provides guidance on healthy diet (i.e. Fact Sheet No 394, September 2014) which translates various nutrient guidelines that WHO develops and updates as part of its normative work. In addition, comprehensive strategies to prevent and control NCDs (including</p>

	obesity) are provided in the NCD Global Action Plan 2013 - 2020 which was endorsed by the World Health Assembly in 2013.
The guideline includes the statement that great improvements have occurred in past decades regarding (the treatment and prevention of) dental caries, but it is not the case. It should, therefore, be referenced.	Relevant references have been provided in the final guideline.
There is a need to specify that not all honeys are used as free sugars or as substitute for other free sugars. Especially those produced in unpolluted areas seem to have less sugar content and a significantly higher content in inflammation inhibiting substances as methylglyoxal in honey made of leptospermum scoparium, New Zealand, arbutus unedo and castanea, Sardinia, Italy. Honey is used also to substitute antibiotics in MRSA and other infections. It should also be noted that substances present in honey inhibit dental caries and periodontal disease and are used since ancient times to prevent treat throat and intestinal inflammatory diseases.	Comment noted.
Consumers have a very limited budget to spend and they try to maximize their limited budget through purchasing the cheapest, but satisfying food products. Low incomes families are consuming refined sugar and refined starch-based food because they are the cheapest alternatives. These low income families are usually fully aware that there are other healthier foods, but healthier food is less palatable or more expensive. For improving the diet of these low income families, the government should not just restrict the availability of existing cheap food that is high in sugars, but rather it should improve the availability of alternative healthy, palatable and affordable food. In this sense, the guideline should be more careful in formulating the recommendations and should not demonize the consumption of sugars. The guideline should restrict the consumption in the specific ranges which are demonstrated to have negative healthy effects by RCTs. Governments and regulatory bodies must provide science-based guidelines, rather than focusing on governments' political interests or companies interests.	Low income families also have the right to access healthy diet. The Declaration and Framework for Action adopted at the Second International Conference on Nutrition (ICN2) held in November 2014 highlighted that food systems should provide year-round access to foods that cover people's nutrient needs and promote healthy dietary practices. Governments together with other concerned stakeholders are, therefore, committed to take necessary action to implement the ICN2 Declaration and Framework for Action and ensure the availability of adequate, safe, diversified and nutritious food that contributes to healthy diets for all.
The term "free sugars" could be understood	To ensure the understanding of the readers, the

<p>differently by different stakeholders, such as academics, food industries or general population, but especially by the target audience of the guideline which is stated as programme managers and policy planners. They may have difficulties in understanding the term and therefore, will have difficulties in managing the implementation of the guideline. Furthermore, the definition of “free sugars” used in the guideline is not consistent with the definition of free sugars used by other competent bodies, including the Institute of Medicine (IOM), American Heart Association and European Food Safety Authority (EFSA), none of which includes fruit concentrates and some of which expressly exclude the sugars from the fruit.</p>	<p>definition of “free sugars” has been included in the beginning of the guideline where the word “free sugars” first appears. The term “free sugars” as defined in the guideline does not include sugars from intact fruit (intrinsic sugars). The other organizations listed generally refer to “added sugars” which are sugars and syrups that are added to foods and beverages during processing or preparation.</p>
<p>The guideline should consider including maltodextrose (maltodextrin).</p>	<p>Maltodextrin is a polysaccharide that is used as a food additive and reviewing the digestibility of different carbohydrates was not the aim of this guideline. Maltodextrin was not considered to be an exposure that should be reviewed when establishing the PCIO questions that guided the literature review.</p>
<p>Potential differential effects on body weight and dental caries of different sugars (i.e. sucrose, fructose, glucose, etc.) need to be considered.</p>	<p>The focus of the guideline is related to free sugars intake. Individual sugars were not considered and it is, therefore, not possible to make specific recommendation on individual sugars in this guideline.</p>
<p>The guideline does not mention which macronutrients should replace the free sugars in the diet. With respect to weight maintenance, if free sugars are substituted for other carbohydrates, there will not be any benefit as they have the same amount of calories per gram. If free sugars are substituted with fat, it may even add more calories to the diet since fat contains 9 kcal/gram. With respect to dental caries, if free sugars are substituted with intrinsic sugars or other fermentable carbohydrates (like starches), there will not be any benefit, either.</p>	<p>The guideline does not recommend to replace free sugars, but rather it recommends to reduce the intake of free sugars throughout the lifecourse. To ensure the achievement of healthy diet, it is stated that the recommendations in the guideline can be translated at the country level into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at the country level. The guideline also states that it should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet.</p>
<p>The meta-analysis focused on body weight stressed that two studies reporting fruit juices as sugars exposure identified an inverse association between fruit juice intake and adiposity in</p>	<p>Of the 21 cohort studies in children included in the review, four showed an inverse relationship between sugars intake and body weight. Two of the studies included showed an inverse relationship</p>

<p>children. Furthermore, several beverages of mixed juice content and nutritional composition are often classified as “fruit juices”. Data from studies focused on a diversity of fruit juice based drinks should not be extrapolated to determine effects of 100% pure juice.</p>	<p>between 100% fruit juice and measures of adiposity. However, two other studies showed a positive relationship between 100% fruit juice and measures of adiposity. It should be noted that the focus of the guideline is related to the intake of free sugars, of which fruit juices are a part. As such, fruit juices were only one of several exposures which the systematic reviews had explored as noted in the PICO questions described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013). Therefore, a systematic review specifically focusing on the health impact of fruit juice consumption was not conducted.</p>
<p>Some studies have shown no association between consumption of 100% fruit juice and overweight in children and adolescents, while others have shown an association. Longitudinal studies in adults tended to report mixed results. It is important to note that excessive intakes of 100% fruit juice, as with most foods, could contribute to weight gain and consequently it is important that intake of 100% fruit juice should be balanced with daily caloric intake and energy expenditure.</p>	<p>Comment noted.</p>
<p>We express concern about the inclusion of fruit juices and fruit juice concentrates in the definition of “free sugars” as it may have an unintentional adverse effect on nutritional status and health of the consumers if they reduce the consumption of fruit juices in an effort to reduce their intake of free sugars. Limiting intake of juice products would likely lead to inadequacies in the intrinsic nutrients they supply, including important nutrients such as potassium, vitamin C and iron, as well as phytonutrients such as carotenoids, flavonoids and polyphenols and soluble fibre like pectin, which are naturally found in juice. Many of these nutrients are not available from alternative beverages such as milk or water.</p>	<p>As noted in the guideline, there is no reported evidence of adverse effects of consumption of intrinsic sugars, and therefore, various important nutrients listed in the comment could be obtained through the consumption of whole and fresh fruit and vegetables which contain various micronutrients as well as fibre. Information on how the recommendations of the guideline can be translated into action is described in the “Translation and implementation” section of the guideline.</p>

<p>Although the research outcomes related to 100% fruit juice intake and overweight/obesity in children, adolescents, and adults are mixed, a comprehensive review of the topic published in 2008 concluded that there was no systematic evidence to suggest that 100% fruit juice intake was associated with overweight/obesity in children and adolescents. Research published since 2008 report mixed findings, with some studies reporting inverse associations between 100% fruit juice intake and body mass index or waist circumference. Some other research suggests that the consumption of 100% fruit juice is associated with better diet quality and increased intake of essential nutrients. For lower-income populations, fruit juices and fruit concentrates may be an important dietary substitute for less accessible fresh fruits. In fact, for lower-income families fruit juices and fruit concentrates may be a nutritionally important dietary substitute for less accessible fresh fruits.</p>	<p>Of the 21 cohort studies in children included in the systematic review by Te Morenga et al. (2013), four showed an inverse relationship between sugars intake and body weight. Two of the studies included showed an inverse relationship between 100% fruit juice and measures of adiposity. However, two other studies showed a positive relationship between 100% fruit juice and measures of adiposity. Regarding dental caries, some studies show positive association between fruit juice consumption and development of dental caries. However, it should be noted that the focus of the guideline is related to the intake of free sugars, of which fruit juices are a part. As such, fruit juices were only one of several exposures which the systematic reviews had explored as noted in the PICO questions described in detail in Annex 6 of the guideline, and in the systematic review by Te Morenga et al. (2013). Therefore, a systematic review specifically focusing on the health impact of fruit juice consumption was not conducted.</p>
<p>As with all foods and beverages that provide calories, 100% orange juice/100% fruit juice should be consumed in appropriate amounts that fit with an individual's overall diet and lifestyle.</p>	<p>Comment noted.</p>
<p>Drinking fruit juice is associated with improved diet quality compared to those who do not drink juice. Several studies show that 100% fruit juice drinkers have higher consumption levels of whole fruit than non-fruit juice drinkers.</p>	<p>Comment noted.</p>
<p>Fruit juices do not represent a major source of sugars intake. According to the CODEX General Standard for Fruit Juices and Nectars "fruit juices have the essential physical, chemical, organoleptical, and nutritional characteristics of the fruit(s) from which it comes" (CODEX STAN 247-2005). Properly extracted juices are very similar to the fruit and they contain most substances which are found in the original ripe and whole fruit from which the juice is made. The relevant substance groups are carbohydrates, acids, minerals, polyphenols including the colourful anthocyanins, water-soluble vitamins, amino acids, aroma compounds, carotenoids, fibre and other bioactive substances. Fruit juices do not contain more sugars than the corresponding fruit. The proposed guideline would not only discriminate fruit juices as non-sweetened</p>	<p>In the paper prepared by Cummings & Stephen for the 2007 FAO/WHO Scientific Update on Carbohydrates in Human Nutrition, it is noted that the rate of digestion and absorption are determined by the physical properties of the food/meal in which the sugars are found and therefore, consuming sugars as whole fruit (i.e. intrinsic sugars) would be different from consuming sugars as fruit juices (i.e. free sugars) in terms of the glycaemic, insulinaemic and satiety responses. The focus of the guideline is related to the intake of free sugars, which fruit juices are part of, but not the intake of intrinsic sugars which are found in whole fruit and vegetables as there is no reported evidence of adverse effects of consumption of intrinsic sugars.</p>

<p>beverages, but also the corresponding fruits or vegetables. Normally, these products are regarded as part of a healthy diet. In the press release of the public consultation, it is stated that, “Five per cent of total energy intake is equivalent to around 25 grams (around 6 teaspoons) of sugar per day for an adult of normal Body Mass Index (BMI)”. This limitation is without a clear justification and would have consequences for the consumption of fruits and fruit juices. Some examples are: One apple of 200 grams contains about 22 grams of sugars. Consequently, by eating a second fruit during the day, the recommendations of the draft guideline would no longer be met as various other fruits contain the following amount of sugars: 200 g of banana contain 42 grams sugars, 200 g of grapes contain 32 g sugars, 200 g strawberries contain 11 g sugars, and the free sugars’ content in corresponding fruit juices is similar.</p>	
<p>The consumption of fresh fruit juice is a cultural norm in the Middle East. So a blanket recommendation to avoid fruit juice may have unintended consequences. For example, neural tube defects continue to be a concern in this region, and fresh juices likely contribute to folic acid intake. Furthermore, some research has shown that orange juice may reduce the proinflammatory effect of a high fat, high carbohydrate meal. While containing calories, juice may also be serving a protective role in heart disease.</p>	<p>It should be noted that the guideline is not recommending to avoid fruit juices, but is recommending to reduce the intake of free sugars, of which fruit juices are a part. There are other WHO documents which provide guidance on the prevention of neural tube defects (NTD) (http://www.who.int/elena/titles/folate_periconceptional/en/). The documents stated that the exact cause of NTD is not known, but folic acid and zinc deficiencies have been proposed as possible causes. It is further stated that known factors associated with higher risk include maternal diabetes, alcohol abuse by the mother, aminopterin ingestion and antenatal X-irradiation, while suspected contributing factors are anticonvulsant therapy, maternal hyperthermia, antenatal exposure to rubella and hallucinogen ingestion. Thus, the possible causes of NTD are numerous. As one of the measures to prevent NTD, WHO recommends that health providers counsel pregnant women who have previously had a baby with NTD or who have diabetes or who are under anticonvulsant treatment to increase their food intake of folate. Food high in folate includes various whole fruit and vegetables (i.e. orange, mango, spinach, broccoli, asparagus, avocado) as well as lentils and beans.</p>

<p>The fact that fruits and traditional dried fruits contain virtually no salt and no fat, and they require none to make them palatable, is a key element to controlling body weight. Fresh and traditional dried fruits have been shown to increase satiety. An analysis from NHANES (1999-2004) data shows that intake of dried fruit is associated with lower body mass index, reduced waist circumference and abdominal obesity.</p>	<p>When fruit is dried, the cellular structure will remain partially intact (though to what extent depends on the drying process). Therefore, despite the fact that sugars are concentrated in dried fruits, in the current guideline, dried fruits are not included in the definition of free sugars. However, further review may be required in the future when updating the guideline, especially in the light of changing composition of the sugars on drying.</p>
<p>Sun-dried, unprocessed fruits should be distinguished from fruit concentrates.</p>	<p>Fruit juice concentrates are included in the definition of free sugars; dried fruits are not.</p>
<p>Because traditional dried fruits are minimally processed, they retain most of the nutritional properties of their fresh counterparts. For this reason they are included within the definition of “fruit” in many WHO publications (Agudo 2005). It is important to make clear that sugars in traditional dried fruit are included in the WHO definition of intrinsic sugars, as traditional dried fruits are an integral part of healthy dietary patterns worldwide.</p>	<p>The referenced document is an analysis of considerations when measuring intake of fruits and vegetables that was commissioned by the WHO and not an official WHO guideline document. When fruit is dried, the cellular structure will remain partially intact (though to what extent, depends on the drying process). Therefore, despite the fact that sugars are concentrated in dried fruits, in the current guideline, dried fruits are not included in the definition of free sugars. However, further review may be required in the future when updating the guideline, especially in the light of changing composition of the sugars on drying.</p>
<p>Fruit juice is no more likely to promote dental caries than whole fruit.</p>	<p>Consumption of whole fruits cause mechanical stimulation of saliva which is protective against dental caries, while juices do not. One portion of fruit juice contains juice from several fruits so the sugars in fruit juice are more concentrated. Whole fruits also contain more factors believed to be protective against dental caries. Epidemiological evidence largely shows negative associations between fresh fruit and dental caries while some studies (some of which are included in the review) show positive associations between fruit juice and dental caries. It should be noted that the guideline is not recommending to avoid fruit juices, but is recommending to reduce the intake of free sugars, of which fruit juices are a part. Fruit juices were only one of several exposures which the systematic reviews had explored as noted in the PICO questions described in detail in Annex 6 in the guideline, and in the systematic review by Moynihan and Kelly (2014). Therefore, a systematic review specifically focusing on the health impact of fruit juice consumption was not conducted.</p>

<p>100% fruit juice, when consumed in appropriate amounts and in balance with other food groups and individual physical activity, is a healthy, nutrient-dense beverage, providing valuable nutrients essential for growth and good health, and can be an important and valuable part of a healthful diet.</p>	<p>It should be noted that the guideline is not recommending to avoid fruit juices, but is recommending to reduce the intake of free sugars, of which fruit juices are a part. Fruit juices were only one of several exposures which the systematic reviews had explored as noted in the PICO questions described in detail in Annex 6 of the guideline, and in the systematic reviews by Te Morenga et al. (2013) and Moynihan and Kelly (2014). Therefore, a systematic review specifically focusing on the health impact of fruit juice consumption was not conducted.</p>
<p>We support the proposed recommendations on how the guidelines can be used, but in addition to the guideline being disseminated through all WHO channels, we also recommend that the message needs to be actively promoted.</p>	<p>Comment noted.</p>
<p>WHO's dietary targets for free sugars could be applied to help inform the creation of restaurant menu labelling notices for foods high in added sugars, food tax reform, nutrition standards for government food procurement (especially foods distributed in schools or other places where children congregate), workplace wellness programs, and efforts to coordinate the reformulation of mass-marketed foods (by informing sugar-reduction targets and monitoring). WHO might also initiate a global dialogue about special measures to address sugar added to soft drinks (including targets and timelines for compositional limits and tax policies).</p>	<p>Information on how the recommendations can be implemented and translated into action is also noted in the "Translation and implementation" section of the guideline which includes examples of measures and interventions that are already being implemented by countries, including food and nutrition labelling regulation of marketing of foods and non-alcoholic beverages that are high in free sugars, and fiscal policies targeting foods and beverages that are high in free sugars. WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic action in accordance with respective countries' context, as appropriate.</p>
<p>The statement "it is feasible to achieve this recommendation while respecting national dietary customs, because a wide variety of fresh foods are naturally low in sugars", should be amended to acknowledge that not just fresh but many other whole foods (plant based foods) are low in sugars, including nuts, cereals, pulses and whole grains.</p>	<p>The word "fresh" is used to emphasize the fact that it is not "processed" food. The word "whole" is now added to clarify the meaning of the statement in the final guideline.</p>
<p>We welcome the expansion of the WHO Global database on the Implementation of Nutrition Action (GINA) to monitor and capture country progress on translating the guidelines into action.</p>	<p>Comment noted.</p>
<p>It is difficult to implement the recommendations in the guideline.</p>	<p>Information on how the guideline should be used and how the recommendations in the guideline can</p>

	<p>be used is provided in the “Translation and implementation” section of the guideline. Examples of measures and interventions which are already being implemented by different countries are also described in the guideline to help the implementation of the recommendations.</p>
<p>The sentence, “It is hoped that the guideline will also help to accelerate the implementation of nutrition actions for improving health and development, and ultimately for reducing the burden of NCDs” should be strengthened. WHO should commit to actively promote this guideline and to encourage and assist countries in the implementation of measures complying with the recommendations.</p>	<p>In the “Translation and implementation” section of the guideline, more detailed information on how the recommendations can be used by policy-makers and other stakeholders, including examples of measures and interventions that are already being implemented by countries, is provided in order to strengthen the guidance on implementation. WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic action in accordance with respective countries’ context, as appropriate.</p>
<p>To reach the public (both children and adults) in a more effective way, direct campaigns should be implemented using public figures, such as international athletes, actors or well-known scientists. Beverage industries should be rigorously controlled in accordance with governmental rules and international recommendations.</p>	<p>Comment noted.</p>
<p>Achieving a sugar intake of less than 10% of daily energy requirements is impractical when implementing a healthy eating plan as this limit not only includes added sugars in foods and naturally-occurring monosaccharides, but also naturally-occurring sugars, in addition to those added by the consumer. For example, a healthy individual consuming 2000 calories a day would exceed this limit simply by consuming five portions of fruit and vegetables a day.</p>	<p>As noted clearly in the guideline, free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. Free sugars do not include intrinsic sugars which are contained in whole fruits and vegetables. Thus this comment seems to be based on a misinterpretation of what is being recommended by the guideline.</p>
<p>Given current dietary patterns and the available food supply, it may be difficult for some populations to achieve a sugar intake of less than 5% of total energy.</p>	<p>Information on how the recommendations in the guideline can be implemented or translated into action is provided in the “Translation and implementation” section of the guideline. Examples of measures and interventions which are already being implemented by different countries are also described in the guideline to help the implementation of the recommendations.</p>
<p>By retaining the 10% threshold and adding an</p>	<p>Comment noted.</p>

<p>additional goal of 5%, countries that have not yet attained a 10% sugars intake level have a pathway to continued reduction rather than be faced by what might be seen as difficult and singular goal at the lower level. Countries can therefore develop measures to address reduction in sugars intake in steps.</p>	
<p>Australian food labelling laws do not require the distinction between free and intrinsic sugars, making it difficult to translate the proposed guideline into practice. Changes to food labelling laws to distinguish between free and intrinsic sugars would facilitate</p> <ul style="list-style-type: none"> • Individual efforts to decrease intake of free sugars • Research to establish population intake of free and intrinsic sugars • Food-based dietary guidelines which reflect the guideline on free sugar consumption. 	<p>As stated in the guideline, the recommendations in this guideline should be translated into culturally and contextually specific food-based guidance that take into account locally available food and dietary customs at the country level. Specific policy and programmatic measures to be taken to implement the guideline also need to be considered based on each country's context.</p>
<p>Currently, the United States Food and Drug Administration has proposed changes to the Nutrition Facts Label on foods and beverages and is considering the declaration of added sugars as well as setting a daily reference value for the purpose of reducing the burden of noncommunicable diseases. The WHO guideline for sugars intake could be adopted as the daily reference value for added sugars.</p>	<p>Comment noted.</p>
<p>The lack of significant public sector research investment in improving the basic epidemiology of diets remains a concern.</p>	<p>Comment noted.</p>
<p>There is a growing body of evidence that policy measures targeting consumer behaviour and promoting healthy diets and lifestyles are not sufficiently effective to counter the increase in overweight and obesity. The food environment and direct availability of cheap sugar plays a major role in the amount of sugar intake. This should be taken into account.</p>	<p>Information on how the recommendations can be implemented and translated into action is also noted in the "Translation and implementation" section of the guideline which includes examples of measures and interventions that are already being implemented by countries, including food and nutrition labelling regulation of marketing of foods and non-alcoholic beverages that are high in free sugars, and fiscal policies targeting foods and beverages that are high in free sugars.</p>
<p>The guideline and surrounding communications for the public could be clearer in terms of the terminology that is used and how this is explained. The guidelines only consider free sugars, namely not those contained in intact fruit or vegetables or</p>	<p>The definition of "free sugars" has been added in the "Scope and purpose" section of the guideline to clarify and facilitate the understanding of the focus of the guideline.</p>

<p>from dairy products. Following media coverage from the public consultation launch, we have been contacted by an increasing number of worried members of the public regarding the health consequences of decreasing consumption of fruits. As a vital part of leading a heart healthy lifestyle, we would be concerned if the public were discouraged from consuming fruit and vegetables based on miscommunication.</p>	
<p>It is not known whether the sugar intake requirements for a person with a high level of physical activity would be the same as for someone with a sedentary lifestyle, or whether sugar requirements would be the same in all countries without reference to their social, religious, political or any other factors having a direct impact on the food consumption patterns of their respective populations.</p>	<p>It should be noted that there is no nutrient requirement for sugars. As described in the guideline, the recommendation to reduce the intake of free sugars is for the prevention of NCDs, in particular related to unhealthy weight gain and dental caries.</p>
<p>Legislative measures should be taken by countries to implement the reduction of free sugars intake, especially in early childhood. Legislation could be an important tool for effectively preventing NCDs, as stated in a report of the World Cancer Research Fund International. We also believe that a firm collaboration between public health communities and legal experts is necessary in order to develop and implement effectively legal framework to tackle obesity and the other NCDs.</p>	<p>Comment noted.</p>
<p>Governments should be given more support to develop policies to educate and guide consumers towards a more balanced diet, promote clearer nutritional labelling and strengthen physical activity programmes.</p>	<p>WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic action in accordance with respective countries' context, as appropriate.</p>
<p>Improvements in nutrition labelling are needed. Sugars added to foods are frequently not clearly recognised on labels as the terminology used for sugars is variable. Consumer products may be labelled as "sugar-free" when they are in fact sweetened with fruit juices, e.g. fruit concentrates. Additionally, some sugars have chemical names that do not allow their identification as sugars by the public. Additionally, food labels do not generally distinguish between free or added sugars and those naturally occurring in foods. Appropriate food labelling with free or added sugars would assist implementation of this</p>	<p>Listing of sugars in nutrition labelling was not mandatory in the Codex guidelines on nutrition labelling until recently. WHO is actively engaged in providing technical and scientific advice to the work of the Codex, including the updating and revising of the guideline on nutrition labelling which was conducted in 2013. The updated guideline now includes mandatory declaration of total sugars in the listing of nutrients. WHO will be happy to work with Member States in translating and implementing the recommendations of this guideline into effective public health policies and strategies as well as programmatic action in</p>

important guideline.	accordance with respective countries' context, as appropriate.
Dental caries are not the only NCD that is expensive to treat; other NCDs related to sugars intake are expensive to treat as well.	Comment noted.
National governments should be encouraged to include Percentage of Daily Value for free sugars on food and product labels based on the proposed 5% guideline. Adding Percentage of Daily Value would give consumers more complete information about the food choices they are making.	Comment noted.
National governments should be encouraged to review economic policies and subsidies that make sugar consumption more affordable than healthier alternatives. In light of the increased health costs associated with sugar consumption, countries should be encouraged to scale back policies that favour the sugar industry at an advantage over other food producers.	Comment noted.
Research is needed to assess the impact of a variety of legislative, policy, programme and public health actions in order to support translation of the recommendations into effective action, including: fiscal policies (such as taxation), trade policies (such as trade liberalisation and foreign direct investment policies), agriculture policies, policies related to the marketing of foods and beverages high in free or added sugars (as well as saturated fat and salt), food and nutrition labelling, and different behavioural change approaches.	Comment noted.
More research is needed to understand the changing patterns of sugars consumption in the population, including the impact of displacement of nutritious foods from the traditional (local) diet and the impact of increased availability of (cheap) processed foods (that are high in sugar) on local markets due to trade policies.	Comment noted.
Monitoring and evaluation to follow the implementation of the guideline is needed to determine its effectiveness.	How WHO plans to monitor and evaluate the guideline implementation is described in the "Dissemination, translation and implementation, and monitoring and evaluation" section of the guideline.
It is noted that no large studies have measured	The need for longer term controlled trials of the

<p>the long-term development of overweight and obesity specifically related to the consumption of sugars. Larger studies with longer durations of follow-up with the use of longer-term dietary assessment methods may be needed, particularly in children.</p>	<p>effect of increasing or decreasing free sugars intake on body weight is noted in the “Implications for future research” section of the guideline.</p>
<p>Scientific information on the potential health risks associated with sugar-sweetened beverages including energy drinks (including metabolic effects with longer-term consumption, metabolic dysregulation, etc.) is needed.</p>	<p>Comment noted.</p>
<p>Guidance on food products that can promote and constitute a healthy diet is more likely to be implemented by individuals (than guidance on nutrients) and is more likely to have a tangible public health benefit.</p>	<p>As noted in the guideline, this guideline needs to be translated into culturally and contextually specific food-based dietary guidelines that take into account locally available food and dietary customs at the country level in order to promote healthy diet. Information on how the recommendations of the guideline can be translated into action is provided in the “Translation and implementation” section of the guideline.</p>
<p>Other guidelines that need to be consulted when making policies to reduce sugars intake should be provided.</p>	<p>In the “Translation and implementation” section of the guideline, it is stated that this guideline should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids (including saturated fatty acids and trans-fatty acids), to guide effective public health nutrition policies and programmes to promote a healthy diet. In the same section, further guidance is also provided as to how the guideline can be used.</p>
<p>Research to assess the health effects of substitution by non-caloric sweeteners is needed.</p>	<p>Comment noted.</p>
<p>A systematic review to assess the effects of increasing or decreasing intake of free sugars on the risks of type 2 diabetes, cardiovascular diseases and other NCDs (including cancer) is needed.</p>	<p>The need for systematic reviews relating free sugars intake to blood lipid levels, blood pressure and diabetes-related outcomes is noted in the “Implications for future research” section of the guideline. It should also be noted that while the finalization of the guideline was underway, a systematic review by Te Morenga et al. (2014) was published which provides evidence that free sugars may influence cardiometabolic risk factors (such as high blood pressure and poor lipid profile) independently of changes in body weight, providing evidence that a reduction in free sugars intake may also be beneficial for reducing risk factors for cardiovascular diseases, such as high blood</p>

	pressure and poor lipid profile.
A systematic review of evidence related to the intake of sugar-sweetened beverages and the risk of cardiovascular disease is needed.	It should be noted that while the finalization of the guideline was underway, two systematic reviews were published (Huang et al. [2014], Keller et al. [2014]) suggesting an association between sugar-sweetened beverage consumption and cardiovascular disease risk factors. However, a limited number of studies were included in the analyses, prompting the authors to note that more studies were needed before firm conclusions can be made.
Further ecological and/or population studies (based on national sugar consumption data) are needed to assess the level of sugars intake and obesity rates. In the countries which intend to implement sugars reduction strategies, particularly through reformulation, they will need to have accurate data on sugars intake and obesity rates before implementing in order to monitor the reduction of sugars intake as well as the level of sugars content in products that are sold to consumers, and the impact of the reduced sugars intake on obesity rate.	Comment noted.
Studies based on a limited number of countries/settings are not applicable for general recommendations. Studies are needed on per capita sugar intake in every country, consumption habits and lifestyles in each country and data on national levels of obesity and tooth decay.	The physiological associations between free sugars intake, body weight and dental caries are expected to be widely applicable across many populations.
Research is needed to assess how a new international code of marketing of foods and drinks for infants and young children can be implemented alongside other WHO codes and WHA resolutions to ensure that infants and young children are given the greatest possible international protection from inappropriate foods and drinks, in particular those high in sugars.	As requested by the World Health Assembly resolutions (WHA63.23, WHA65.6), WHO is currently in the process of developing guidance on controlling inappropriate promotion of foods for infants and young children.
Research is needed to better understand the potential addictive nature of sugars intake (i.e. at what level of intake and for what age group).	Comment noted.
Research is needed to estimate the economic costs of oral diseases in terms of school and work days lost, pain, their contribution to other NCDs, and cost of treatment.	Comment noted.

Quality data on dental caries as well as oral health as a whole should be collected and compiled by WHO.	Comment noted.
Research is needed to assess the link between sugars intake and dental caries in low- and middle-income countries.	The need for studies in developing countries is noted in the “Implications for future research” section of the guideline, as the “need to undertake new cohort studies with improved methodology for assessing dietary intake in areas that have or have not been fluoridated.”
Further research is needed to assess the link between the frequency of free sugar exposure and dental caries.	Comment noted.
Further research is needed to examine the impact of diet quality on dental caries.	Comment noted.
More longitudinal cohort studies assessing the relationship between sugars intake and dental caries are needed, particularly in adults.	The need to undertake new cohort studies with improved methodology is noted in the “Implications for future research” section of the guideline.
Additional studies on body weight and dental caries are needed, looking specifically at the effects of free sugars in solid foods compared to the effects of free sugars in the form of sugar-sweetened beverages, as there may be differences in effect.	The need to evaluate different behavioural-change approaches to promote the reduction of free sugars intake, in particular the intake of sugar-sweetened beverages, which is identified as a behavioural risk factor contributing to calorie overconsumption is noted the “Implications for future research” section of the guideline.
Assessment of the role of vested interests in challenging evidence to support the reduction of sugars intake, including in low- and middle-income countries, should be conducted.	Comment noted.
Research is needed to assess unintended consequences of severe reductions in sugars intakes (i.e. less than 5% of total energy intake) on diet quality and food security in populations. Sugars are added to a variety of foods and beverages, including nutrient-dense choices (especially in the dairy category). For populations already under-consuming calcium and vitamin D, identified as “nutrients of concern” in the 2010 Dietary Guidelines for Americans, further reducing sugars intakes may further inhibit adequate intakes. This is especially concerning for undernourished populations.	It should be noted that milk products are available without the addition of free sugars (sugars naturally present in milk are not part of free sugars and therefore, are not included in the recommendations of this guideline). The guideline also notes that providing overall dietary guidance is outside the scope of this guideline because such guidance should be based on overall dietary goals that consider all required nutrients. However, it is feasible to achieve the recommendations in this guideline while respecting national dietary customs, because a wide variety of whole and fresh foods are naturally low in sugars.
Research is needed to assess unintended	As described in the definition of conditional

<p>consequences of actions which may be taken by the food industry in reducing the free sugars content of foods in order to meet the less than 5% of total energy intake recommendation, such as increased use of artificial sweeteners or non-nutritive starches.</p>	<p>recommendations included in the guideline extracted from the WHO handbook for guideline development (2014) as well as in the information note issued together with the guideline to facilitate the public understanding of the recommendations, a conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs could not be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy in each country's context.</p>
<p>Research is needed to assess sugars content in milk and milk products for mothers, supplementary foods and ready-to-use therapeutic food for malnourished children, products claiming to be food for special medical use, and food products targeting older infants.</p>	<p>The guideline states that intake of free sugars is not considered an appropriate strategy for increasing caloric intake in individuals with inadequate energy intake if other options are available. It also states that the recommendations do not apply to individuals in need of therapeutic diets, including for the management of severe and moderate acute malnutrition.</p>
<p>It would be helpful to add a recommendation, or remark, about the applicability of these guidelines to complementary feeding, especially with regard to meeting energy density requirements in complementary foods, including cereal based foods.</p>	<p>The guideline states that intake of free sugars is not considered an appropriate strategy for increasing caloric intake in individuals with inadequate energy intake if other options are available. This also applies to complementary foods and to guide effective public health nutrition policies and programmes to promote healthy diet, this guideline should be used in conjunction with other dietary guidelines related to complementary food, including the Codex guidelines on formulated complementary foods for older infants and young children and Codex standard for processed cereal-based foods for infants and young children as well as other related WHO documents related to complementary feeding.</p>
<p>The guideline states that intake of free sugars is not considered an appropriate strategy for increasing caloric intake in individuals with inadequate energy intake if other options are available. It would be helpful to include examples of other options in the guideline.</p>	<p>Including guidance on appropriate strategies for increasing caloric intake in individuals with inadequate energy intake is beyond the scope of this guideline. Guidance on increasing caloric intake in individuals with inadequate energy intake can be found in other WHO documents.</p>
<p>Research is needed to develop a method for measuring the intake of free sugars in a consistent manner.</p>	<p>Comment noted.</p>
<p>Free sugars is too broad a concept to be</p>	<p>Comment noted.</p>

<p>considered useful for recommendations. Analytical tools now allow for the study of individual sugars and isomers of sugars. Further research is needed to develop cheaper tools for analyzing carbohydrates (including rare sugars) and their functional role before suggesting a restriction on the consumption of a full generic group of carbohydrates under the name of “free sugars” that include all monosaccharide and disaccharides present in any food.</p>	
<p>Regional and international food composition databases need to be updated to include data on sugar content of food.</p>	<p>Comment noted.</p>
<p>Role of breakfast on intake of sugars and on obesity as well as dental caries needs to be addressed in the future.</p>	<p>Comment noted.</p>
<p>Further research is needed to assess the relationship between the consumption of free sugars and body weight in children as this is where the quality of evidence is not as strong as it is for adults.</p>	<p>The need for longer term (>8 weeks) controlled trials of the effect of increased or decreased free sugars intake on body weight not limited to children, but in free-living individuals, as well as the need to assess thresholds related to the risk of unhealthy weight gain, are noted in the “Implications for future research” section of the guideline.</p>
<p>The implications of eliminating fruit juices and fruit juice concentrates in the food supply on dietary intake of essential vitamins and minerals should be investigated.</p>	<p>The guideline is not recommending the elimination of fruit juices and fruit juice concentrates in the food supply. The recommendations are to reduce the levels of free sugars intake, of which fruit juices and fruit juice concentrates are a part.</p>
<p>Research is needed to investigate the consequences of labelling fruit juices and fruit juice concentrates as sources of “free sugars” on consumers’ food choices and their nutritional status.</p>	<p>Comment noted.</p>
<p>Further research is needed to identify what works best to reduce obesity in large community settings and the way in which governments can best invest in different research.</p>	<p>Comment noted.</p>