WholEUGrain Summerschool 2021

How to develop a Whole Grain recommendation?

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Outline

- Background
  - Food Based Dietary Guidelines – why quantitative?
  - Examples of current recommendations
  - History of whole grain guidelines in Denmark
- The Danish example 2008
- Principles and flow in establishing whole grain guidelines
- Take-home messages

Food Based Dietary Guidelines

Health based

"Provide…. guidance on the contribution of different foods or food groups to an overall diet that would help to maintain good health through optimal nutrition" (EFSA 2010)

Translate nutrient recommendations in combination with evidence on relation between foods or food groups and disease risks

Guidance on changes

Relative: "limit", "increase" "exchange" (NNR2012)

Direction: "eat more/less"

Or

Quantitative: grams or servings:

"max/min" or "around"

Per day (per gender/age group) or per 10 MJ

Advantage:

More applicable for the consumer

Benchmark for the individual:

Is this advice targeted me?

But – difficulties in being too precise

Healthy sustainable diets

"Dietary patterns that promote all dimensions of individuals' health and wellbeing, have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable."

WHO. Sustainable Healthy Diets—Guiding Principles; WHO: Geneva, Switzerland, 2019.

Examples of current guidelines on whole grain

Qualitative

- "Prefer whole grain" (e.g. Belgium, Malta, Poland, France)
- "Replace white-flour bakery products with whole-grain bakery products" (Czech Republic)

Semi-quantitative

- "Prefer wholemeal bread and other whole grain products. Replace at least half of the white bread with wholemeal" (Bulgaria);
- "Swap refined grains with whole grains and consume at least one serving of whole grain food as bread, pastry or side dish a day" (Hungary).

Quantitative

- "Eat at least 90 grams of brown bread, wholemeal bread or other wholemeal products/4-5 servings of whole-grain foods every day" (The Netherlands);
- " "Eat whole-grain foods – at least 75 g of whole grains per day or more" (Denmark).

Quantitative incl. sustainability

- Eat Lancet global reference diet: daily whole-grain intake should be 232 g/2500 kcal
- Danish adapted plant-rich diet: whole grain level: about 120 g/10 MJ (Lassen et al. 2020)

FAO Global view of FBDGs

Africa

- Benin
- Kenya
- Namibia
- Nigeria
- Seychelles
- Sierra Leone
- South Africa

Asia and the Pacific

- Afghanistan
- Australia
- Bangladesh
- Cambodia
- China
- Fiji
- India
- Indonesia
- Japan
- Malaysia
- Mongolia
- Nepal
- New Zealand
- Philippines
- Republic of Korea
- Sri Lanka
- Thailand
- Viet Nam

Near East

- Iran
- Lebanon
- Oman
- Qatar

Europe

- Albania
- Austria
- Belgium
- Bosnia and Herzegovina
- Bulgaria
- Croatia
- Cyprus
- Denmark
- Estonia
- Finland
- France
- Georgia
- Germany
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Latvia
- Malta
- Netherlands
- Norway
- Poland
- Portugal
- Romania
- Slovenia
- Spain
- Sweden
- Switzerland
- The former Yugoslav Republic of Macedonia
- Turkey
- United Kingdom

Latin America and the Caribbean

- Antigua and Barbuda
- Argentina
- Bahamas
- Barbados
- Belize
- Bolivia (Plurinational State of)
- Brazil
- Chile
- Colombia
- Costa Rica
- Cuba
- Dominica
- Dominican Republic
- Ecuador
- El Salvador
- Grenada
- Guatemala
- Guyana
- Honduras
- Jamaica
- Mexico
- Panama
- Paraguay
- Saint Kitts and Nevis
- Saint Lucia
- Saint Vincent and the Grenadines
- Uruguay
- Venezuela

North America

- Canada
- United States

- National FBDG
  - World: 92 (96) out of 195 countries
  - Europa: 33 (34) out of 50 countries
- Published 1986-2019 (mean 2009)
- Most do not use defined Strength Of Evidence

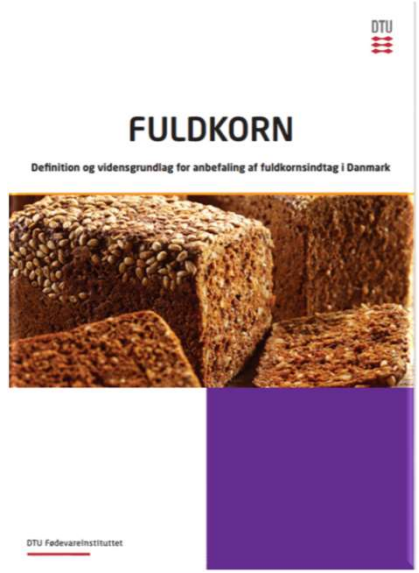
http://www.fao.org/nutrition/education/food-dietary-guidelines/en/

Food-based dietary guidelines

An analysis of methods used to synthesize evidence and grade recommendations in food-based dietary guidelines (Blake et al. Nutrition Reviews (2018))

- 79 countries with FBDG
- 32 recent (≥2010) FBDG
- 18 of 32 based on other countries FBDG
- 5 guidelines *de novo* SR and reported SOE methodology
  - Australia: NHMRC body of evidence grading system
  - Germany: WHO levels of evidence
  - NNR: WCRF
  - USA: NESR (former NEL) grading rubric
  - New Zealand: Technical advisory group
- No guidelines used a “strict” GRADE
- Most countries used a consensus-based approach to formulate the recommendations

The Danish example 2008



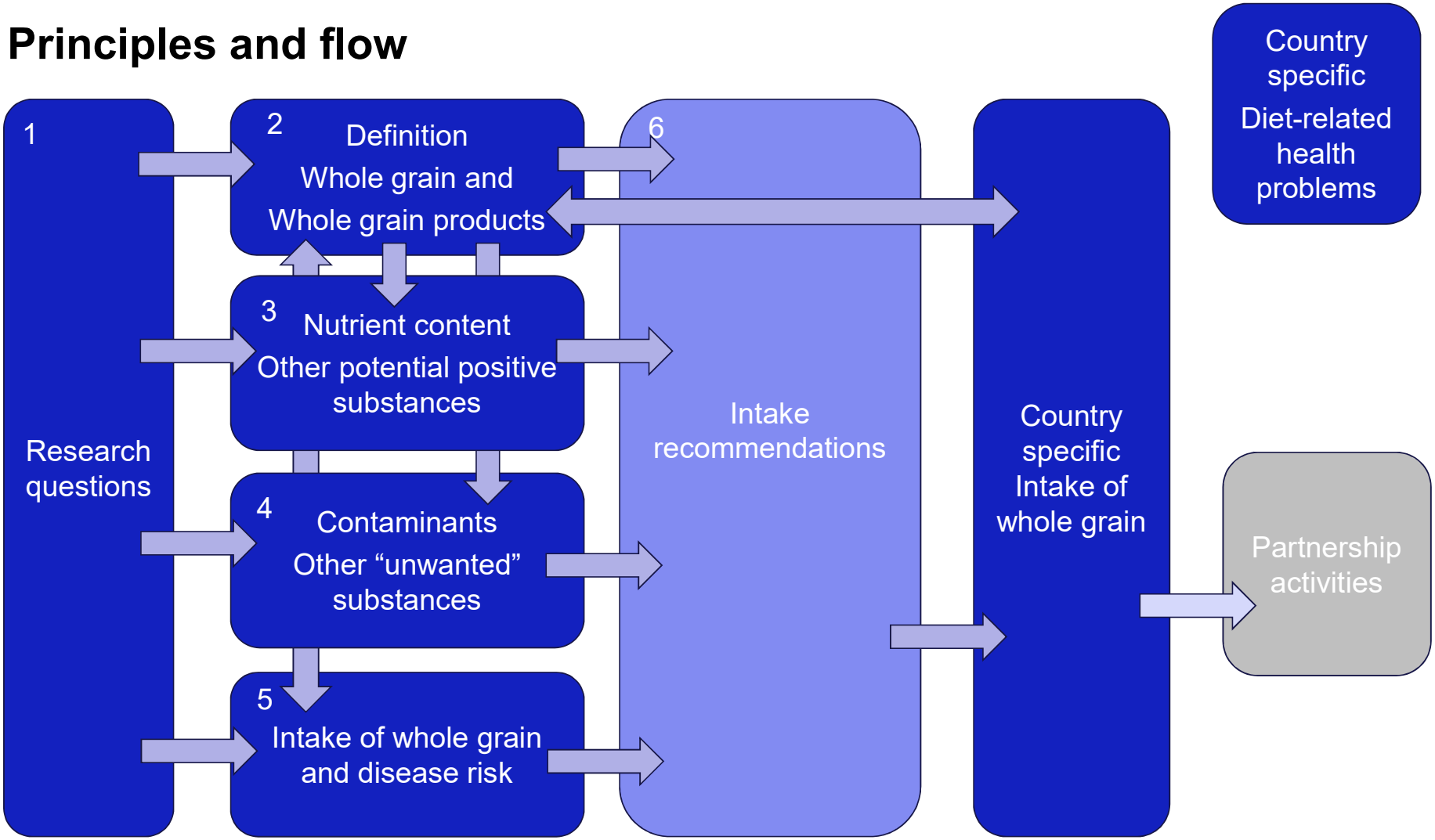
- Definition of whole grains and whole grain products
- Nutrient content and content of other bioactive substances
- Intake of whole grain and disease risks – systematic review
- Contaminants and other unwanted substances
- Recommended intake of whole grain
- Intake of whole grain in Denmark

Need for definitions – which species – amount in whole grain products
(related to the studies on disease risk)
Need to clarify the nutrient content and possible other positive and negative substances
Systematic review – good quality – but not following today's standards
+ overview of diet-related health problems in Denmark
+ focus on definition of products and the amounts studied
Recommendations: More weight to studies conducted in countries with comparable intake
Knowledge about intake in Denmark to be used for partnership priority

Method development
Examples from Denmark

- The Danish fruit and vegetable recommendation 6 a day, back in 1998, (literature review)
- (establishing the fruit and vegetable partnership in 2000)
- Danish food based dietary guidelines – update in 2005 (no WG) (science based)
- The whole grain recommendation in 2007-2008 (systematic literature search)
- Danish food based dietary guidelines – update in 2013 (and NNR 2012-14) (systematic according to WCRI method)
- Danish food based dietary guidelines – update in 2021 (integrating Climate) (based on 2013 and newer reviews/studies)
- NNR2022 update – integrating climate and environmental sustainability
  (systematic according to published methods)

Principles and flow



Research questions

Which species?

How much processing is acceptable?

How much whole grain should be included in a whole-grain food product?

Which products are available / does the population eat?

Existing definitions to adapt?

Nutrient content, (starch, dietary fiber, protein, vitamins, minerals)?

Other potential positive substances (lignans, phenols, phytosterols)?

Any “unwanted” substances that may be found in whole grain and whole grain products?

(Heavy metals and melloids, polycyclic aromatic hydrocarbons, pesticides, N-nitrosamines, mycotoxins, acrylamids, bacteria)

From cultivation? Storing? Processing?

“What is the relationship between whole-grain intake and incidence of specified diseases and mortality risk?”

Any new systematic synthesis of systematic reviews? How is the quality? WG and WG product definition?

How do we build on former work?

Conduct a systematic review or umbrella review?

Follow methodology guidance!

Intake recommendations

Express in a usable way for a national recommendation

Take local dietary habits into consideration

Take the nutrient contribution from grain foods to the total diet into consideration and adjust the recommendation accordingly

Optionally, consider sustainability

Decide how the recommendation should be communicated

Scientific evidence.

Assessment of the quality of systematic reviews, and **Methodology of conducting a high quality systematic reviews**

- Assess the quality of conduct of review and rate the overall confidence in the results:
  A MeaSurement Tool to Assess systematic Reviews (AMSTAR) 2
- Grade the quality of evidence of meta-analyses contained within the systematic reviews: NutriGrade. (Schwingshackl et al. Adv. Nutr. 2016)
- Methodological guidance for conduct of overviews of reviews (umbrella reviews): (https://www.training.cochrane.org/handbook (updated March 2020); Aromataris et al. Int J Evid Based Health 2015)

Alternative tools (The WholEUGrain report, chapter 3):

- A quality-grading scheme was adapted from the guidelines of the USA's National Institutes of Health
- Quality grading scheme was adapted from the approach of the World Cancer Research Fund International (WCRF)

NNR2022 Methodology:

Criteria of "qualified Systematic reviews" (Christensen et al. Food & Nutrition Research 2020)

8 steps when developing qualified SRs: 1) define research question, 2) protocol development, 3) literature search, 4) screening and selection of studies, 5) data extraction, 6) assessing risk of bias, 7) synthesis and grading of total strength of evidence, and 8) reporting according to certain standards.

Specific requirements to each step (Arnesen et al. Food & Nutrition Research 2020)

'Risk of Bias for Nutrition Observational Studies' (RoB-NObS) tool (USDA's Nutrition Evidence Systematic Review (NESR) team).

Prerequisites for setting national whole grain recommendations

Country specific knowledge

- about cereal products on the market, preferable: intake and intake distribution of the population and subpopulation, possibly future products
- about nutrient content and content of other compounds
- about possible contaminants and other unwanted products

Scientific evidence of relation between whole grain and disease risk:

Newest synthesis of systematic reviews – assess the quality,

- consider new systematic reviews or supplementary work – quality assurance with newer studies

Consider the types of cereals on the market in relation to the types of cereals in the various studies

Sum up – take-home-messages

- Advantages of quantifying guidelines
- The methods to ensure evidence based guidelines have developed
- Build on available scientific work – assess the quality –
  relate to local food consumption and market
- Make use of exiting systematic reviews and tools for evaluating quality
  or guidance tools for conducting new systematic reviews or overview reviews

Thanks to
Lene M Christensen and other colleagues

References

- Chapter 6: Establishing a quantitative recommendation for whole-grain intake

  Heddie Mejborn, Anja Biltoft-Jensen, Lene Møller Christensen
  National Food Institute, Technical University of Denmark
  https://www.gzs.si/wholeugrain/vsebina/Publications/Reports/Evidence-base-report

- EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA); Scientific Opinion on establishing Food-Based Dietary Guidelines. EFSA Journal 2010; 8(3):1460. Available online: www.efsa.europa.eu

- NNR2022 methodological papers:

  Christensen et al. Food & Nutrition Research 2020
  Arnesen et al. Food & Nutrition Research 2020a
  Arnesen et al. Food & Nutrition Research 2020b


WholEUGrain

WholEUGrain project

A European Action on Whole Grain Partnerships

Funded under the Annual Work Plan 2018 (grant agreement 874482)

Deliverable number 4.1

Evidence base for the health benefits of whole grains including sustainability aspects

Whole grain:
definition, evidence base review, sustainability aspects and considerations for a dietary guideline.

Description: Report on the updated evidence base for health effect and sustainability aspects of whole grains

User Guide: The purpose of this deliverable is to ensure the knowledge base as one of the prerequisites for establishing a national whole grain partnership

WP 4: *Implementation tools for whole grain Partnerships*


food & nutrition research

REVIEW ARTICLE

Nordic Nutrition Recommendations 2022 – handbook for qualified systematic reviews

Erik Kristoffer Arnesen[1], Jacob Juel Christensen[1,2], Rikke Andersen[3], Hanna Eneroth[4], Maijaliisa Erkkola[5], Anne Høyer[6], Eva Warensjö Lemming[4], Helle Margrete Meltzer[7], Þórhallur Ingi Halldórsson[8], Inga Þórsdóttir[8], Ursula Schwab[9], Ellen Trolle[3] and Rune Blomhoff[1,6,10]*

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