

Open session with the Standing Committee for the review of the DRI Framework

Questions to inform statement of work on
macronutrient DRIs

October 11, 2024

Background: DRI Macronutrient review

- Multi-year project that began in 2021
- Large and complex – many nutrients, age-sex groups, categories of DRI values
- Major aspects include:
 - Standing Committee for the Review of the DRI Framework (NASEM)
 - to address over-arching issues related to DRIs
 - Evidence scanning and commissioning independent systematic reviews
 - to support eventual DRI derivation
 - Review of macronutrient DRIs (NASEM)
 - Dietary Reference Intakes for Energy completed in 2023
 - Focus of upcoming review: Protein, Fat, Carbohydrate and Fiber

Single consensus committee

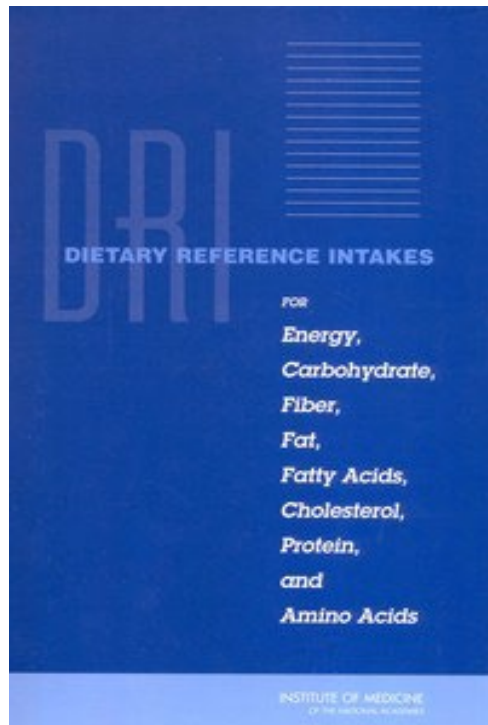
- Discussed options for organization at dialogue with Standing Committee (July 2022)
- Take-aways:
 - Metabolism of macronutrients is highly inter-related, ideal would be to do all macronutrients concurrently (i.e., one committee)
 - Some types of values can likely be done separately (ex., essentiality of nutrients)
 - Collective values are important for coherence; need to ensure communication between all committee members and working groups

Structure of the review

- One committee to establish DRIs for protein, fat, carbohydrate and fiber
 - The macronutrient committee will likely divide in smaller working groups to help complete the work efficiently
- Ensure the macronutrient committee has linkages to Standing Committee
 - Liaison member(s)
 - Open dialogues throughout the project
- Sponsors' aim: report in late 2028

Scope of the review

DRI Report on macronutrients (2002/2005)



Nutrient	Type of DRI value set						
	EAR	RDA	AI	AMDR	ND	Add'l Rec.	Other
Protein	✓	✓		✓			
Amino acids	✓	✓					
Carbohydrate	✓	✓		✓			
Added sugars					✓	✓	
Total fibre			✓				
Total Fat				✓			
MUFA					✓		
PUFA					✓		
N-6 fatty acids			✓	✓			
N-3 fatty acids			✓	✓			
Sat fat					✓	✓	
Trans fat					✓	✓	
Cholesterol					✓	✓	
Energy (kcal)							EER
Physical activity							rec.

Nutrients
anticipated as
being
examined
and potential
DRI values

Nutrient	Type of DRI Value		
	Requirement	Toxicity	Chronic Disease
	EAR/RDA or AI	UL	CDRR
Protein & Amino Acids			
Total Protein	◆	◆	◆
Essential AA	◆	◆	
Other AA		◆	
Carbohydrates & Fiber			
Digestible carbohydrate	◆		◆
Sugars			◆
Fibers	◆		◆
Fat & Fatty acids			
Total fat	◆		◆
n-3 PUFA & subtypes	◆	◆	◆
n-6 PUFA & subtypes	◆	◆	◆
SFA & subtypes			◆
CLA			◆
Monounsaturated fatty acids			◆
PUFA			◆

DRI Report on macronutrients (2002/2005)

How should all nutrients/subjects covered in the initial macronutrient report be addressed in the new macronutrient review?

(i.e. physical activity, dietary cholesterol, trans fats, added sugars)

Nutrient	Type of DRI value set						
	EAR	RDA	AI	AMDR	ND	Add'l Rec.	Other
Protein	✓	✓		✓			
Amino acids	✓	✓					
Carbohydrate	✓	✓		✓			
Added sugars					✓	✓	
Total fibre			✓				
Total Fat				✓			
MUFA					✓		
PUFA					✓		
N-6 fatty acids			✓	✓			
N-3 fatty acids			✓	✓			
Sat fat					✓	✓	
Trans fat					✓	✓	
Cholesterol					✓	✓	
Energy (kcal)							EER
Physical activity							rec.

Rethinking the Acceptable Macronutrient Distribution Range for the 21st Century: A Letter Report

Recommendation 2:

In future reviews of DRIs for macronutrients, **the expert review panel should consider macronutrient quality**, the requirement for essential nutrients associated with macronutrient intake, and the reference values for their constituent nutrients and other food substances as supported by the evidence.

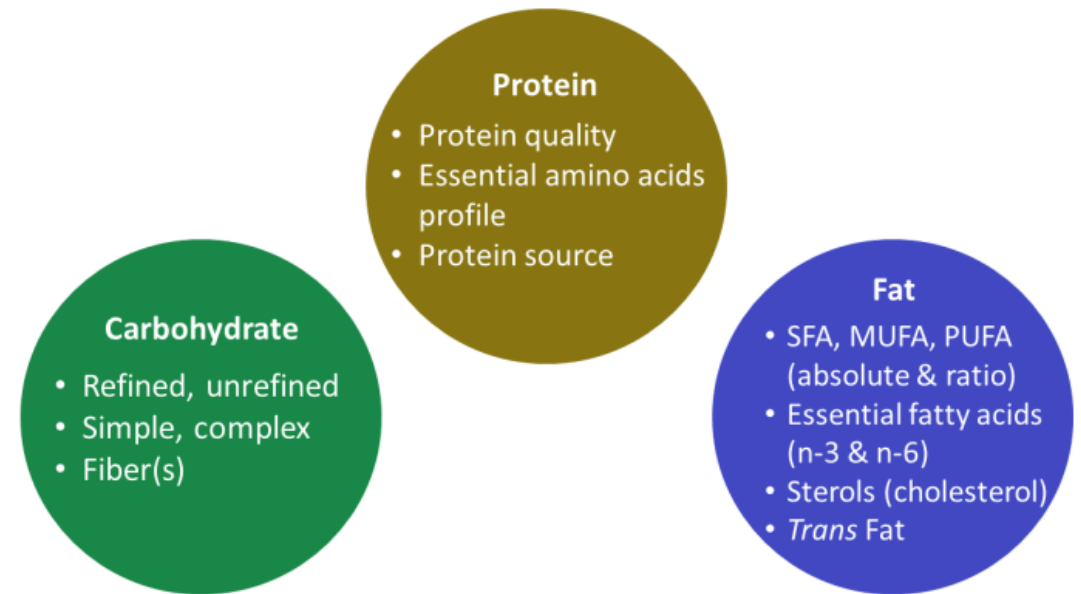


FIGURE 5-2 Quality factors for consideration when formulating DRI values for fat, carbohydrate, and protein.

NOTES: MUFA = monounsaturated fatty acid; PUFA = polyunsaturated fatty acid; SFA = saturated fatty acid.

DRIs vs. Dietary Guidelines

- **DRIs are nutrient standards** = quantitative recommendations for a nutrient *per se* in relation to a given outcome
 - Used as one input, amongst many, in developing dietary guidelines
- **Food-based dietary guidelines** (also known as dietary guidelines) are intended to establish a basis for public food and nutrition, health and agricultural policies and nutrition education programmes to foster healthy eating habits and lifestyles.
- They provide advice on foods, food groups and dietary patterns to provide the required nutrients to the general public to promote overall health and prevent chronic diseases.

<https://www.fao.org/nutrition/education/food-based-dietary-guidelines>

How can macronutrient quality best be addressed within the DRI paradigm?

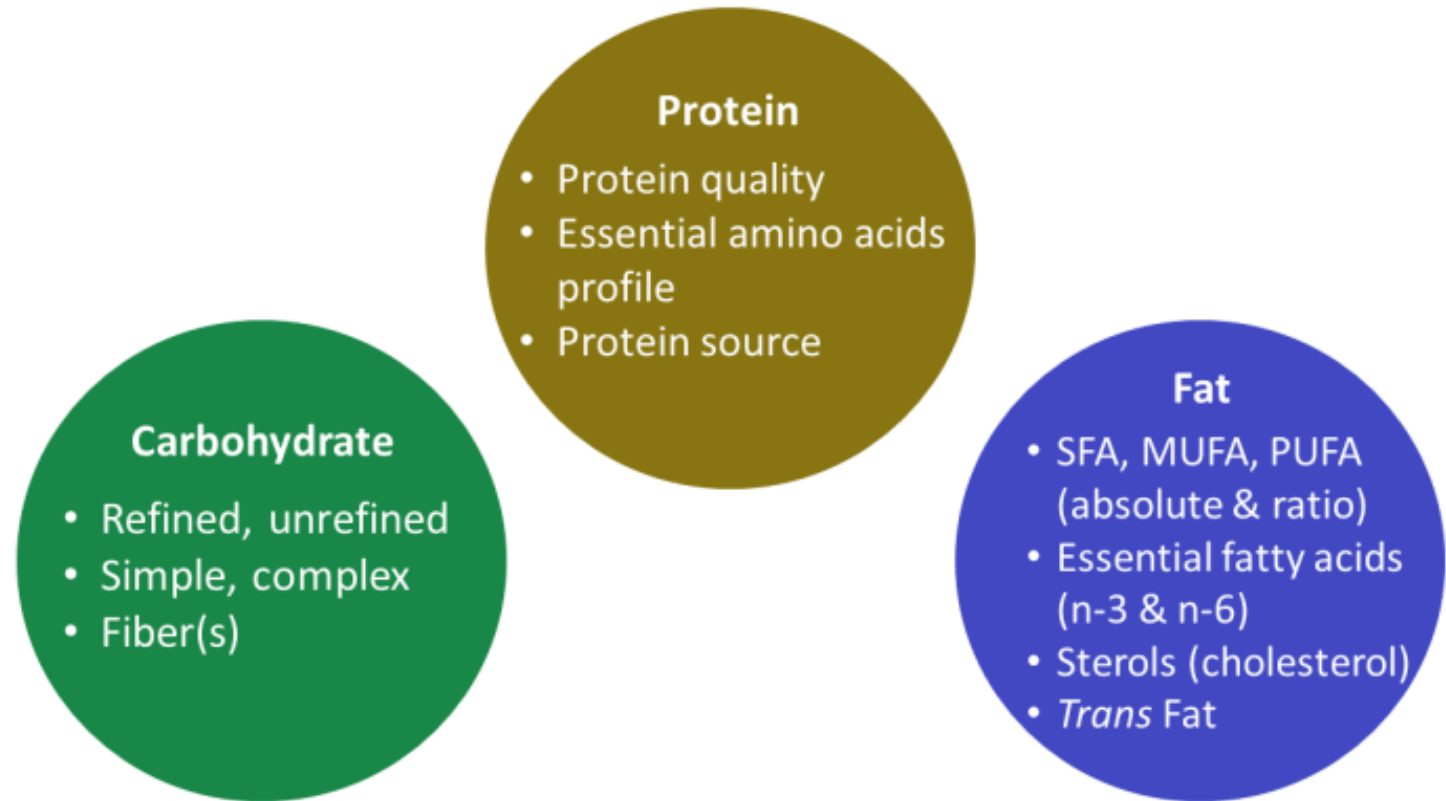


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Evidence preparation to facilitate the review

Evidence scanning and systematic reviews

- Provision of a systematic review to a NASEM DRI committee:
 - Allows committee members to focus their time on interpreting the available data
 - Increases transparency of the DRI process
- BUT
 - SRs are resource-intensive
 - Not all topics have the level of evidence to justify undertaking SR
- Joint DRI WG has been using **evidence scanning** to undertake an initial assessment of the evidence base on macronutrients to:
 - identify whether sufficient new evidence exists
 - decide if undertaking a systematic review is appropriate
 - allow prioritization of resources
 - identify existing high quality systematic reviews

Evidence scanning and systematic reviews in preparation for macronutrient DRI review

Protein and Amino Acids:

- Evidence scan on requirements, adverse effects, chronic disease outcomes (NESR)
- 2 AHRQ SRs - expected fall 2024
 - Requirements for protein and individual indispensable amino acids
 - Bone health, renal health, sarcopenia

Digestible Carbohydrate Intake & Chronic Disease Risk

- Evidence scan on chronic disease outcomes (NAL)
- 2 AHRQ SRs – expected end of 2024
 - CVD; T2DM; growth, size, and body composition

Evidence scanning and systematic reviews in preparation for macronutrient DRI review

Digestible Carbohydrate and Maternal-Infant outcomes

- Evidence scan (NAL)
- AHRQ SR - expected mid-2025
 - Intake in pregnancy and gestational weight gain; offspring growth, size, and body composition
 - Intake in 0-2 y and growth, size, and body composition

Fiber and health outcomes

- Evidence scan on functional and chronic disease outcomes (University of Ottawa)
- AHRQ SR - expected mid-2025
 - Laxation/gut motility

Evidence scanning and systematic reviews in preparation for macronutrient DRI review

Fat/fatty acids and maternal-infant health

- Evidence scan for identification of existing high quality systematic reviews (NAL)
- AHRQ SR - expected mid-2026
 - Intake of polyunsaturated fatty acids (subclasses, individual fatty acids, fatty acid ratios) during pregnancy and/or lactation in relation to risk of preterm birth, infant/child growth (birth to 18 y), infant/child development (birth to 18 y)
 - Intake of total fat and polyunsaturated fatty acids (subclasses, individual fatty acids, fatty acid ratios) by children (birth to 18 y) in relation to infant/child growth (birth to 18 y), infant/child development (birth to 18 y)

Evidence scanning and systematic reviews in preparation for macronutrient DRI review

Fat/fatty acids, blood lipids/lipoproteins, and cardiovascular events

- Evidence scan for identification of existing high quality systematic reviews (NAL)
- 2 AHRQ SRs - expected mid-2026
 - Exposures
 - Replacement of total saturated fatty acids, or individual saturated fatty acids, with: other types of fat/fatty acids; carbohydrates; fibre; protein
 - Intake of polyunsaturated fatty acids (subclasses, individual fatty acids, ratios)
 - Outcomes
 - Blood lipids/lipoproteins (e.g., LDL-C) in adults and children (birth to 18 y)
 - Cardiovascular events (e.g., myocardial infarction, stroke) in adults

Evidence scanning and systematic reviews in preparation for macronutrient DRI review

- All “de novo” systematic reviews have been commissioned
 - evidence scans will be made publicly available
- Existing high quality systematic reviews are being identified for protein, digestible carbohydrate, and fiber based on SRs retrieved in evidence scans using criteria from the second NASEM letter report
 - Identification of existing high quality SRs already integrated into evidence scanning on fat and fatty acids
- Human Milk Composition Initiative will also provide relevant data

Summary of evidence preparation so far

Are there important evidence gaps that would be helpful for the sponsors to fill to support the NASEM macronutrient DRI review?

Legend

Ev scan = evidence scan conducted

QSR = identification of existing high quality systematic reviews

AHRQ SR = systematic review commissioned through AHRQ

X = evidence preparation regarded as not applicable by the Federal DRI WG

Pink = areas where an evidence scan is being contemplated by the Federal DRI WG

Nutrient	Type of DRI Value		
	Requirement	Toxicity	Chronic Disease
	EAR/RDA or AI	UL	CDRR
== Protein & AA ==			
Total Protein	Ev scan AHRQ SR	Ev scan	Ev scan & QSR AHRQ SR
Essential AA	Ev scan AHRQ SR	Ev scan	X
Other AA	X	Ev scan	X
== Carbohydrates & Fibre ==			
Digestible CHO	Open session AHRQ SR	X	Ev scan & QSR AHRQ SR
Sugars	X	X	
Fibers	Ev scan AHRQ SR	X	Ev scan & QSR
== Fat & Fatty acids ==			
Total fat	QSR scan AHRQ SR	X	QSR scan
n-3 PUFA & subtypes	QSR scan AHRQ SR		QSR scan AHRQ SR
n-6 PUFA & subtypes	QSR scan AHRQ SR		QSR scan AHRQ SR
SFA & subtypes	X	X	QSR scan AHRQ SR
CLA	X	X	QSR scan
monounsaturated	X	X	QSR scan

Overarching issues that may
impact the work of the
macronutrient DRI committee

Overarching issues related to developing DRIs for macronutrients

- Current thinking by the sponsors:
 - The Standing Committee is available to the NASEM DRI macronutrient committee and should be utilized if questions relevant to the completion of the task on macronutrient DRIs arise
- Examples of possible topics:
 - Extrapolation between life-stage groups
 - Surrogate markers of chronic disease risk or nutrient adequacy
 - Appropriate data to underpin Adequate Intake values

Overarching issues: Questions for discussion

- Which overarching issues are most critical to address?
- Do any of these issues need to be addressed prior to the macronutrient committee beginning its work?
- What might be the best approach?
 - Open session with the Standing Committee?
 - Workshop / invited speakers?
 - Letter report from Standing Committee?



Additional comments
or thoughts?

