Utilization of a Free Database tool on Fiber and Health Outcomes

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Outline

- Fiber Database
  - Overview
  - Development
  - Data
- How to access the database
- Applications of the database
- Considerations

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Dietary Fiber

- Synthetic or purified fibers in the form of supplements
- Individual isolated fiber (e.g. pectin and gum)
- Enriched ingredients (e.g., oat bran, psyllium, or lupin kernel flour enriched breads)

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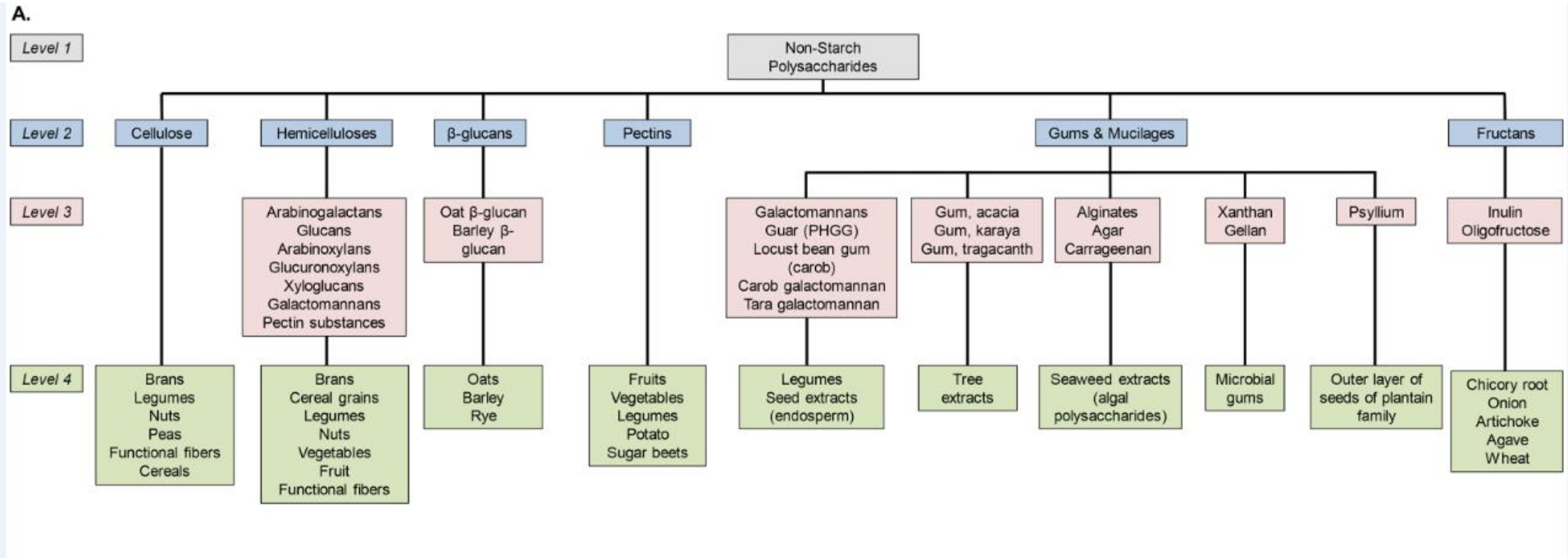
Why do we need a fiber database?



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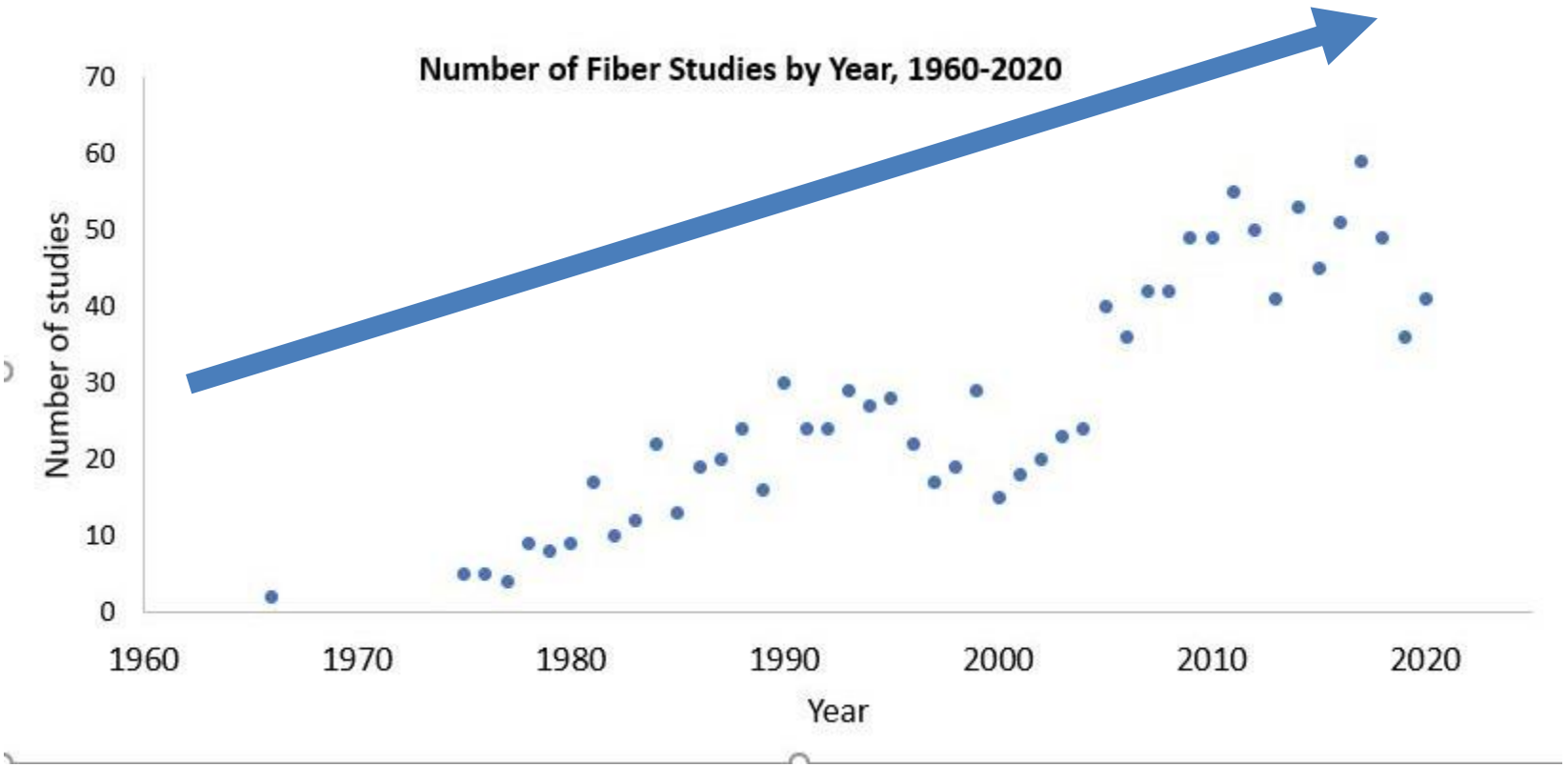
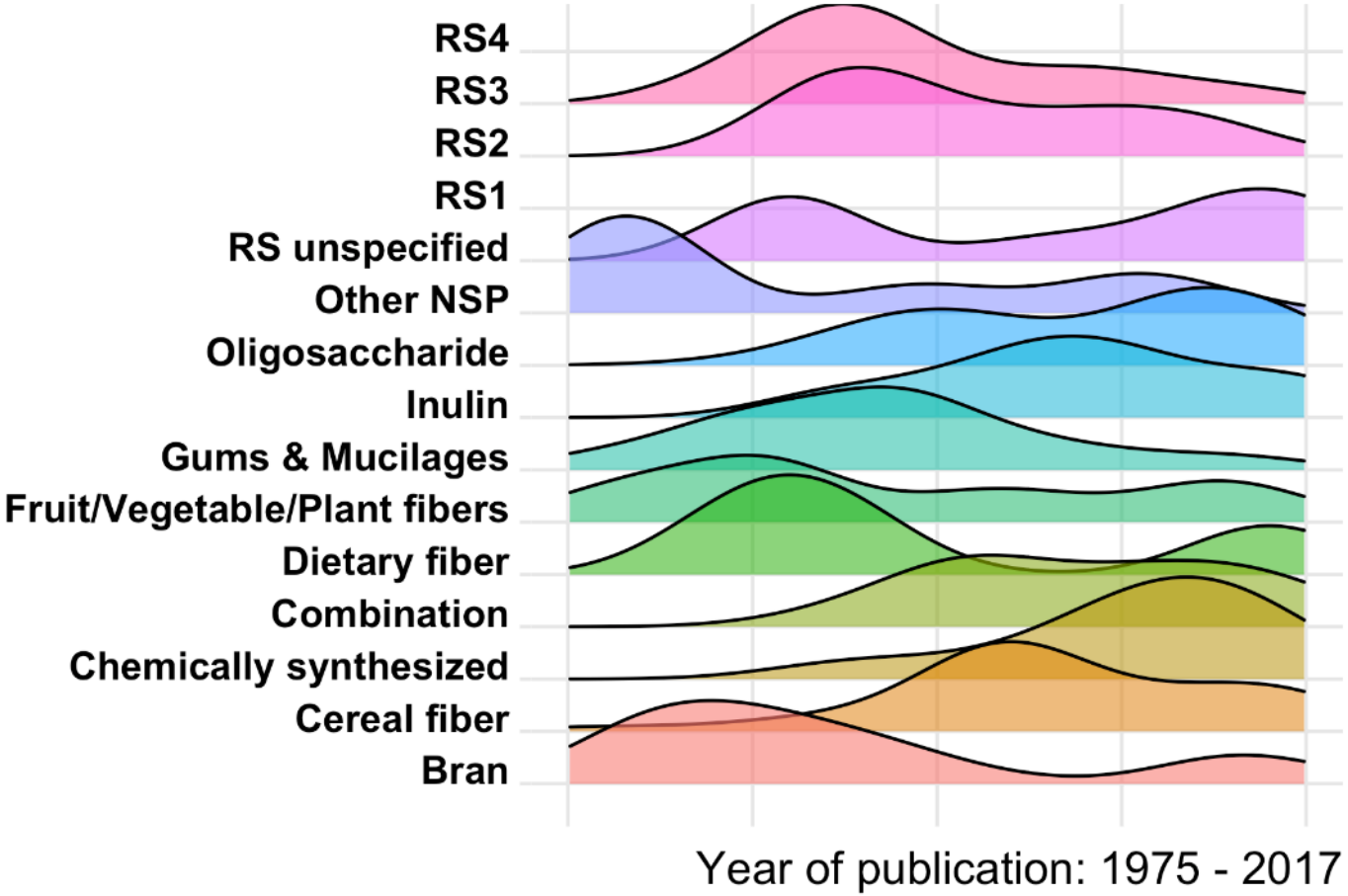
Research on Health Benefits of Fiber Continues to Grow



Changing Research Landscape
Fiber & Gut Health



Plot by Dr. Larry Parnell

Dietary Fiber Database

RESEARCH ARTICLE

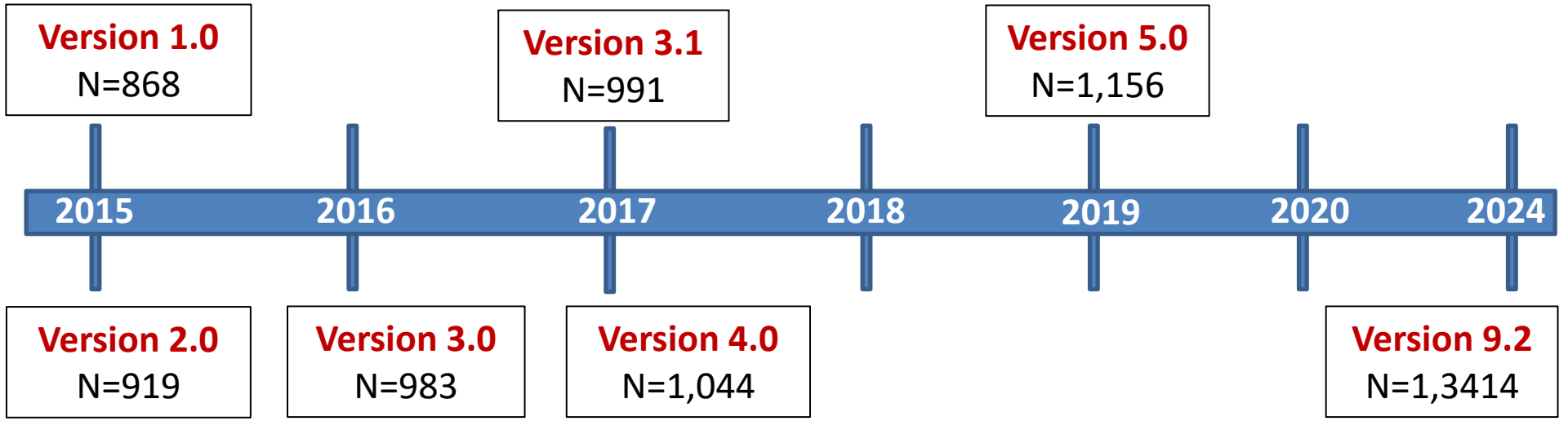
Development of a Publicly Available, Comprehensive Database of Fiber and Health Outcomes: Rationale and Methods

Kara A. Livingston[1], Mei Chung[2], Caleigh M. Sawicki[1], Barbara J. Lyle[3], Ding Ding Wang[2], Susan B. Roberts[1], Nicola M. McKeown[1,4]*

Overall Goal

Establish a comprehensive database designed as the foundational resource for capturing human literature connecting dietary fibers to health-related outcomes.

Database Timeline



Database Creation

Create a search criteria

↓

Conduct search in Medline **n=11,833**

↓

Create initial exclusion criteria

↓

Inclusion:

- Published in English
- Intervention studies
- Fiber term + one health outcome
- Adults and Children

Exclusion:

- Reviews, bibliographies, case reports, observational studies
- Population is pregnant and/or breastfeeding women
- Intervention has no concurrent control arm
- Fiber dose not clearly reported
- An outcome of interest is not reported
- Intervention not sufficiently controlled to measure effect of fiber
- Fiber not orally ingested
- Population has disease (i.e. cancer, renal failure, infectious)
- Synbiotic intervention
- In vitro studies

What Data Did We Extract?

PICO	
Population	Age Gender BMI Health status
Intervention	Fiber type Dose Duration Administration
Comparator	Type (control) Dose Duration Administration
Outcome	Vahouny outcomes

Outcomes

- Total and LDL-cholesterol
- Post-prandial glucose and insulin
- Blood pressure
- Increased fecal bulk and laxation
- Transit time
- Colonic fermentation
- Short-chain fatty acid production
- Modulation of colonic microflora
- Weight loss, weight maintenance, and reduction in adiposity
- Increased satiety
- Bone health

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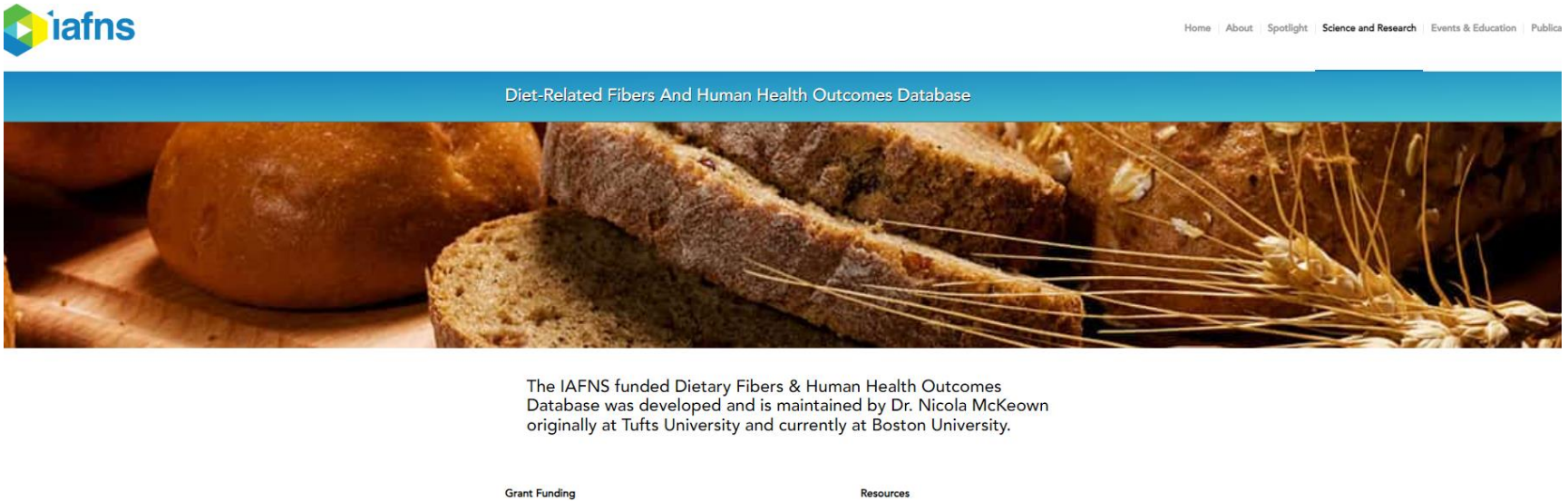
Where can you access this database?



https://iafns.org/our-work/research-tools-open-data/dietary-fiber-database/

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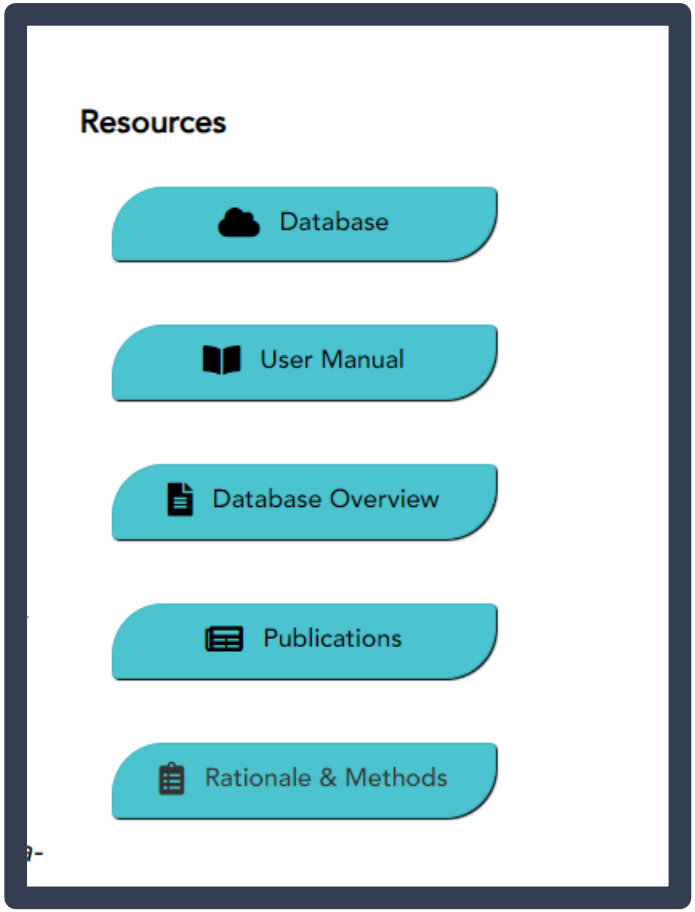
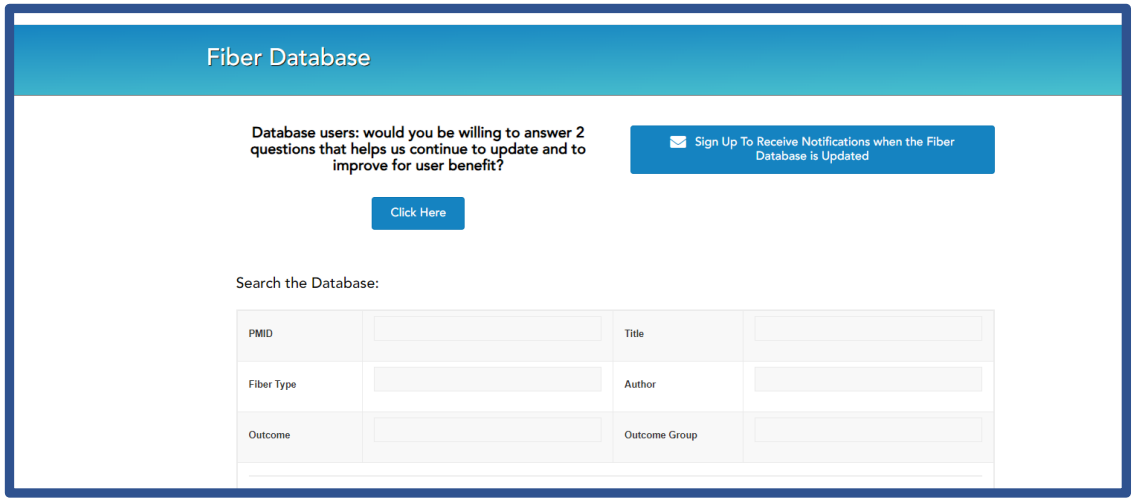
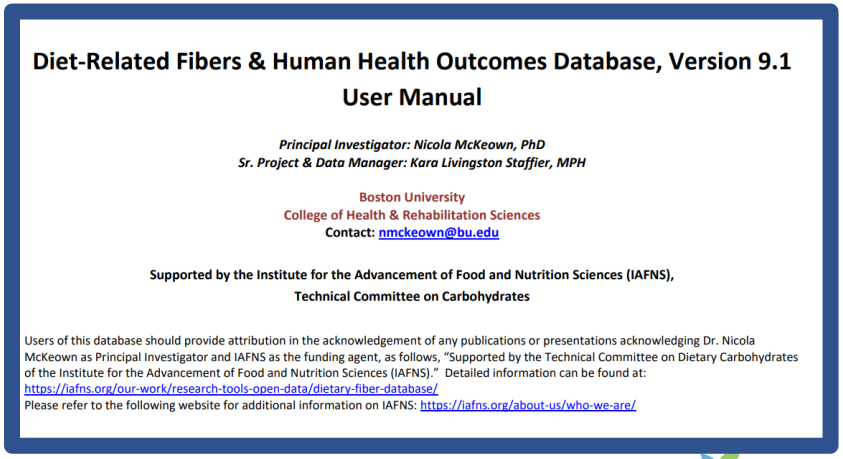
What can you expect?







Diet-Related Fibers & Human Health Outcomes Database, Version 9.1
User Manual

Principal Investigator: Nicola McKeown, PhD
Sr. Project & Data Manager: Kara Livingston Staffier, MPH

Boston University
College of Health & Rehabilitation Sciences
Contact: nmckeown@bu.edu

Supported by the Institute for the Advancement of Food and Nutrition Sciences (IAFNS), Technical Committee on Carbohydrates

Users of this database should provide attribution in the acknowledgement of any publications or presentations acknowledging Dr. Nicola McKeown as Principal Investigator and IAFNS as the funding agent, as follows, "Supported by the Technical Committee on Dietary Carbohydrates of the Institute for the Advancement of Food and Nutrition Sciences (IAFNS)." Detailed information can be found at: https://iafns.org/our-work/research-tools-open-data/dietary-fiber-database/
Please refer to the following website for additional information on IAFNS: https://iafns.org/about-us/who-we-are/

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Database users: would you be willing to answer 2 questions that helps us continue to update and to improve for user benefit?

Click Here

Sign Up To Receive Notifications when the Fiber Database is Updated

Search the Database:

PMID		Title	
Fiber Type		Author	
Outcome		Outcome Group	

Publication Year Range

Beginning Year		End Year	

SEARCH

Download excel database: [Descriptive Labels | Shorter Labels for Statistical Software]

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Database in Excel

	G	H	I	J	K	L	M	N	O	P
	Title	**Year**	**Author**	**study_id**	**pubyear**	**country**	**design**	**blindness**	**diet**	**feedcontrol**
	The digestion of pectin in the human gut and its effect on calcium absorption and large bowel function.	1979	Cummings JH., Southgate DA., Branch WJ., Wiggins HS., Houston H., Jenkins DJ., Jivraj T., Hill MJ.	100479	1979	United Kingdom	Non-randomized Controlled Trial	Unspecified	Unspecified	All food provided
	Absence of effect of bran on blood-lipids.	1975	Connell AM., Smith CL., Somsel M.	16746	1975	United States	Randomized Controlled Trial (parallel)	Unspecified	Isocaloric/Maintenance	All food provided
	Depletion and disruption of dietary fibre. Effects on satiety, plasma-glucose, and serum-insulin.	1977	Haber GB., Heaton KW., Murphy D., Burroughs LF.	20138	1977	United Kingdom	Randomized Controlled Trial (Crossover)	Unspecified	Acute Feeding Study	All food provided
	Unabsorbable carbohydrates and diabetes: Decreased post-prandial hyperglycaemia.	1976	Jenkins DJ., Goff DV., Leeds AR., Alberti KG., Wolever TM., Gassull MA., Hockaday TD.	16750	1976	United Kingdom	Randomized Controlled Trial (Crossover)	Unspecified	Acute Feeding Study	All food provided

Statistical Packages for Analysis

While the data is readily downloadable in excel, we recommend that users wanting to conduct analyses import the data into a statistical software package.

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Searchable Interface

Search the Database:

PMID		Title	
Fiber Type	Soluble Corn Fiber	Author	
Outcome		Outcome Group	

Publication Year Range

Beginning Year		End Year	

SEARCH

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14 papers

14

Order by Year

Download Data

PMID	TITLE	AUTHOR	PUBLICATION YEAR	
32235569	The Role of Soluble Corn Fiber on Glycemic and Insulin Response.	Tan WSK., Chia PFW., Ponnalagu S., Karnik K., Henry CJ.	2020	View Details
26731113	Prebiotic Potential of a Maize-Based Soluble Fibre and Impact of Dose on the Human Gut Microbiota.	Costabile A., Deaville ER., Morales AM., Gibson GR.	2016	View Details
27281813	Soluble Corn Fiber Increases Calcium Absorption Associated with Shifts in the Gut Microbiome: A Randomized Dose-Response Trial in Free-Living Pubertal Females.	Whisner CM., Martin BR., Nakatsu CH., Story JA., MacDonald-Clarke CJ., McCabe LD., McCabe GP., Weaver CM.	2016	View Details
27465372	Soluble corn fiber increases bone calcium retention in postmenopausal women in a dose-dependent manner:	Jakeman SA., Henry CN., Martin BR., McCabe GP., McCabe LD., Jackson	2016	View Details

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At a glance

Download excel database: [Descriptive Labels | Shorter Labels for Statistical Software]

Pubmed ID (PMID)	32235569
Title	The Role of Soluble Corn Fiber on Glycemic and Insulin Response.
Author	Tan WSK., Chia PFW., Ponnalagu S., Karnik K., Henry CJ.
Publication Year	2020
Country of Publication	China
Study Design	Randomized Controlled Trial (Crossover)
Was study blinded?	Unspecified
Study diet type	Acute Feeding Study
Level of feeding control for intervention	All food provided
Sample size	100

At a glance

Was there a run-in period?	Unspecified
Was there a washout period?	Yes
Did the administered fiber dose change over the course of the st	No
Was the study population adults (20+ years)? (1=yes)	1
Study population, mean age in yrs	36.7
Study population, age range in years	23.8–60.8
Study Population, mean BMI, kg/m2	23.6
Study population, BMI Range, kg/m2	18.5-30
Was the population healthy? (1=yes)	1
Gender, % male	100
Fiber 1- Type	Soluble Corn Fiber
Fiber 1- Dose 1, g	26
Fiber 1-Duration of Intervention	1 meal
ministered?	Combination of foods
	Soluble Corn Fiber

Outcome examined #1	Glucose (blood), postprandial
Outcome 1 is associated with which outcome group of interest?	V- Postprandial glycemia/insulinemia
Outcome examined #2	Insulin (blood), postprandial
Outcome 2 is associated with which outcome group of interest?	V- Postprandial glycemia/insulinemia

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Applications

- To identify gaps in research by conducting evidence-based reviews and meta-analyses
- To provide a tool to help stakeholders understand how different fibers are characterized in research studies
- To assist product developers to identify the research available on specific fiber ingredients

Some considerations….

- Search strategy restricted to Medline
- No assessment of study quality
- Outcomes are limited per inclusion criteria (i.e., no immune function, inflammation)
- Fiber exposures should be reviewed by users to determine whether groupings may be desirable
- Does not include results
- *Visualization of body of literature*
- *Updatable*
- *Flexible*
- *Cost and time efficient*

Diet-Related Fibers & Human Health Outcomes Database

Developed by an expert team led by Dr. Nicola McKeown at Boston University

Funded by the Institute for the Advancement of Food & Nutrition Sciences

Current version 9.2 containing 1,341 entries capturing new literature through Sept 2023

Helpful to anyone conducting an evidence review on fiber and the following health outcomes, providing data on population, intervention, comparator, and outcome (PICO)

1. Total and LDL cholesterol
2. Post-prandial glucose & insulin
3. Blood pressure
4. Increased fecal bulk and laxation
5. Transit time for food to move through digestive track
6. Colonic fermentation & short chain fatty acid production
7. Modulation of colonic microflora
8. Weight loss, weight maintenance, and reduction in adiposity
9. Increased satiety
10. Bone

Excel database and user manual are available by contacting Dr. McKeown (nmckeown@bu.edu) and at the IAFNS website (https://iafns.org/our-work/research-tools-open-data/dietary-fiber-database).

Thank IAFNS for funding
Managers: Kara Livingston, Elizabeth Zalis
Many research team members

Have questions? Need help with the database?

nmckeown@bu.edu