Science Connections-
Accessing Tools to Support Your Literature Review

• **Moderator:** Dawanna James-Holly, PhD

• **Presenter:** Wendy Shaw MBA, RDN
  • Presentation: *Getting Started: Developing Food Safety Literature Reviews*
  • **Presenter:** Megan Kocher, MLIS
  • Presentation: *Systematic Reviews and Evidence Synthesis in Food Safety*

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Webinar Housekeeping

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• This webinar is being recorded and will be available for access by IAFP members at www.foodprotection.org within one week.
Science Connections – Accessing Tools to Support Your Literature Review

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Science Connections-
Accessing Tools to Support Your Literature Review

This forum will help the participant:

• Learn about the information products available to scientists at USDA’s National Agricultural Library, and at their University or institutional libraries.

• Initiate search strategies and access customizable tools to support the literature review process.

• Take a deep dive into modes of evidence synthesis in food safety and tools/strategies to support it.
INTRODUCTION OF THE SPEAKERS:

Wendy Shaw, MBA RDN
Branch Chief, National Agricultural Library

Wendy Shaw is the Branch Chief for the Information and Customer Service Branch at USDA’s National Agricultural Library. In this role, Wendy oversees eight information centers in the areas of food safety, nutrition, alternative farming, rural information, agricultural law, invasive species, animal welfare, and water quality and agriculture, as well as NAL’s reference staff in the customer service unit. She is also an Adjunct Professor at George Washington University, Milken School of Public Heath. Ms. Shaw holds an MBA in Marketing from Loyola College, and a Bachelor of Science in Clinical Dietetics and Nutrition from the University of Pittsburgh. She is a Registered Dietitian.
Megan Kocher is the science librarian for the Departments of Food Science and Nutrition, Animal Science; and Soil, Water, and Climate at the University of Minnesota. She is also co-chair of the University of Minnesota Libraries systematic review team. Megan received a master of library and Information science degrees at the University of Wisconsin – Milwaukee and a Bachelor of Arts in Psychology from Brown University. Megan has been an active board member of the Academic and Research Library Division and chaired Minnesota’s Library Association’s Intellectual Freedom Committee. Megan has led numerous groups within the University of Minnesota Libraries and the U.S. Agricultural Information Network.
Getting Started: Developing Food Safety Literature Reviews

Wendy Shaw, MBA, RDN
Branch Chief, Information & Customer Service
National Agricultural Library/ARS/USDA
The Library & Literature Reviews

• The role of the library
• How librarian’s can support the literature review process
• Accessing the library’s resources for your literature review
• Creating your search strategy
• Selecting your research database(s)
• Collaborations for obtaining literature
About the National Agricultural Library

• One of five U.S. national libraries
• Houses one of the world’s largest collections devoted to agriculture and its related sciences, with both physical and digital collections
• Eight information centers across such topics as food safety, nutrition, water quality, alternative farming, and animal welfare
• Is a branch of ARS and collaborates with agencies inside and outside of USDA

https://www.nal.usda.gov
Food Safety Research Information Office

- **History**: The Food Safety Research Information Office (FSRIO) was created by the Agricultural Research, Extension and Education Reform Act of 1998 launched in 2001.

- **Audience**: Food Safety Researcher Community

- **Content highlights**: Provides access to food safety grants and projects, publications and videos. Helps to prevent unintended duplication of research.
FSRIO Research Projects Database

- Extensive collection of more than 12,000 food safety research projects
- Track U.S. and international government agencies, and private organizations
- Browse by food safety topics, commodities, date, title, principal investigator, funding sources
FSRIO Research Publication Feeds

• Provides access to the latest food safety research publications, including ahead of print

• Tracks more than 200 journals focused on food safety topics

• Publications generated by feeds are grouped by:
  o Journal
  o Subject
What is a Systematic Review?

According to SAGE Research Methods:

• “…a literature review focused on a research question that tries to identify, appraise, select, and synthesize all high-quality research evidence relevant to that question.”

• “…the next step after conducting a literature review is assessing the relevance of published research to a research question.”

• “…aims to provide an exhaustive summary of current literature relevant to a research question.”

Benefits of Systematic Reviews

- Address unnecessary duplication
- Keep current on subject areas of interest
- Examine impact of research results
- Establish levels of evidence
- Minimize bias and random errors when reviewing existing knowledge
- Find new techniques or collaborators
Agriculture and Systematic Reviews

• Systematic reviews typically conducted in delivery of health care
• Other fields conducting reviews include educational research, sociology, business and management
• Recent growth of reviews in agriculture
• All have the need for data, published literature, and assessment
Role of the Librarian

• Identifies the foundational piece or starting point for your literature review strategy
• Serves as your partner for literature reviews
• Supports you in clarifying the research question
• Advises on key terms and concepts
• Designs repeatable search strategies in scientific databases
• Implements search in databases, and sends citations to researcher for review
• Applies in multiple databases for comprehensive results
The Library as a Database Resource

DigiTop is a service of the National Agricultural Library (NAL) delivering licensed electronic resources to authorized USDA users.
The Library as a Database Resource

- **Databases**
  - Navigator
  - Scopus
  - ProQuest
  - PubMed

- **Journals**
  - Full Text
  - 7,000 titles
  - Protocols

- **News Sources**
  - NewsBank
  - Financial Times
  - Wall Street Journal

- **Directories**
  - Leadership Connect
  - Foundation Directory Online
Trusted vs. Non-Trust Journal
Features of Non- Trusted Journals

• Peer-review process not clearly defined
• Editor-in-chief is not an expert in the journal’s subject matter
• Editorial board members’ affiliations not noted
• Journal titles similar to established journals to create confusion
• Author fees are not stated or unclear
• Publisher notifies author of publication fee after article acceptance
Features of Non-Trusted Journals

- Very low author fees charged to attract large numbers of article submissions
- Misleading information about the publisher’s actual country of origin
- Scope of journal is very broad - any subject content can be accepted for publication
- Americans serve as editors-in-chief as means of legitimizing journals
How to Initiate Your Search
Design Your Search Strategy

1. Form a research statement
2. Identify the major subject(s) or topic(s) to be investigated
3. Expand on your research statement with related terms or concepts
4. Identify the most important concepts and combine to form your search statement
5. Determining whether to use AND, OR, NOT
6. Become familiar with specific database search requirements
7. Examine the results and refine your search as necessary
8. Add more specific terms, as needed
9. Narrow or expand your search
10. Identify variations of terms
Refine or Expand Your Search Terms

The NAL Thesaurus

Finding Synonyms
https://agclass.nal.usda.gov

Topic Area:
Food Safety Modernization Act

Used For:
FDA Food Safety Modernization Act
Food Safety Modernization Act
US FDA Food Safety Modernization Act

Broader Term:
Food law
Search Strategy Example

**Question:** What is the Food Safety Modernization Act?

1. Break query into concepts
   - Food Safety Monitoring Act

2. Create a list of search terms with synonyms
   - FDA Food Safety Modernization Act, US FDA Food Safety Modernization Act, FMSA, food law

3. Combine terms and search as a Boolean statement
   - Boolean statement: ("FDA Food Safety Modernization Act" OR "Food Safety Modernization Act" OR "FMSA" "food law")

4. Review results
Selecting Your Database
Establish Database Selection Criteria

- What are the preferred publications in your topic area?
- Can you locate the publications in the database?
- Are your topic areas found in the database?
- What is the year span of the database?
- Can you access the database and its journals?
- Do you belong to a federal or university library to access the database and its licensed journals?
Databases Commonly Used for Literature Reviews

- AGRICOLA
- Scopus
- BIOSIS
- CAB
- Web of Science
- PubMed
- ProQuest
- SAGE
- Cochrane Database of Systematic Reviews
- Covidence
Managing Your Search Process
Managing Your Search Process

<table>
<thead>
<tr>
<th>Search</th>
<th>Alerts</th>
<th>Citation Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Search</td>
<td>Weekly</td>
<td>Record of last 30 searches</td>
</tr>
<tr>
<td>Advance Search</td>
<td>Monthly</td>
<td>Return later for review</td>
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<tr>
<td>Expert Search</td>
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Why Set Up Alerts?

- Address unnecessary duplication
- Stay informed and up-to-date
- Save time repeating searches
- Set-up varies by resource
- Database alerts allow you to track
  - Authors and/or subjects
  - Citations
Collaborations for Literature Reviews

- Interlibrary Loan with other libraries
- License agreements with databases for literature
- Collaboration on literature reviews
- Ceres 2030: Sustainable Solutions to End Hunger
- PubAg/PubMed Integration
Thank You!

Wendy Shaw
Branch Chief, Information & Customer Service
National Agricultural Library

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Systematic Reviews and Evidence Synthesis in Food Safety

Megan Kocher, MLIS, University of Minnesota Libraries, mkocher@umn.edu
Review Spectrum

- Narrative Review: Subjective, Broad Question, Methods Unclear
- Scoping Review: Subjective, Broad Question, Methods Unclear
- Systematic Review: Objective, Narrow Question, Methods Clearly Defined
- Meta-Analysis: Objective, Narrow Question, Methods Clearly Defined
Recommended Reading

What is a Systematic Review?

A review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review. Statistical methods (meta-analysis) may or may not be used to analyse and summarise the results of the included studies.

From [http://community.cochrane.org/glossary#letter-S](http://community.cochrane.org/glossary#letter-S)
Key Components of a Systematic Review

- A **methodical, comprehensive** literature synthesis focused on a well-formulated research question
- Identifies and synthesizes **all** of the available literature on particular topic
- Included and excluded studies are determined systematically using pre-determined criteria
Key Components of a Systematic Review

◦ Is conducted in an unbiased, **reproducible** way
◦ Identifies gaps in research
◦ Provides evidence for practice and policy-making
The Review Type Depends on the Question

- **Meta-analysis** - What is the strength of evidence? (quantitative analysis)
- **Systematic review** - What is the strength of evidence? (qualitative analysis)
- **Scoping review** - What do we know about research into this question? What is the nature of the research? What are the gaps in the research? What theories have been applied to the research?
Forming A Systematic Review Question

Systematic Reviews answer questions of effectiveness

Does this intervention:

- Work?
- Not work?
- Or is there insufficient evidence?
“Goldilocks” Syndrome

- **Too broad:** What are the health benefits of green tea?
- **Too narrow:** Which type of green tea--macha or sencha--reduces rate of heart attack in an otherwise healthy population?
- **Just right (almost):** What is the impact of green tea on blood pressure?
“Russian Doll” Questions

What are the best practices, including practices around waste disposal, patient transport and transfer, personal protective equipment, and patient isolation policies, for the prevention of secondary infection of infectious disease for health care workers and patients?

...this is actually 8 questions
PICO

Population/Patients/Problem
Intervention
Comparison
Outcome

For this population, does this intervention more than this comparison result in this outcome?
PICO Example

For teenagers, does chocolate cause more pimples than jelly beans?
(side note: this is based on an actual study)

P  Teenagers
I  Chocolate
C  Jelly beans
O  Number of pimples
Other Frameworks For Questions

- PICo (Population, Interest, Context) (qualitative research)
- ECLIPSE (Expectation, Client Group, Location, Impact, Profession Service)
- SPICE (Setting, Perspective, Intervention, Comparison, Evaluation)
- SPIDER (Sample, Phenomenon of interest, Design, Evaluation, Research type)
Example Questions

What is the efficacy of slaughter and processing interventions to control *Salmonella* in beef and pork?

https://doi.org/10.4315/0362-028X.JFP-16-203

What is the efficacy of instant hand sanitizers against foodborne pathogens compared with hand washing with soap and water in food preparation settings?

https://doi.org/10.4315/0362-028X.JFP-15-492

What are the effects of pasteurization on vitamin levels in raw vs. pasteurized milk?

https://doi.org/10.4315/0362-028X.JFP-10-269
Working With A Librarian on a Systematic Review
Systematic Reviews: How Librarians Collaborate

**Protocol Development**

**Subject matter experts will**
- Refine & finalize the research question
- Write the background section
- Write eligibility criteria & screening plans
- Write risk of bias assessment methods
- Write data extraction & synthesis methods

**Librarian co-authors will**
- Identify sources for searching
- Design search strategy for the “master database”
- Provide background and guidance on protocol development and registration
Why Register a Protocol?

Publication of a protocol for a review prior to knowledge of the available studies...

- reduces the impact of review authors’ biases,
- promotes transparency of methods and processes,
- reduces the potential for duplication,
- and allows peer review of the planned methods.

From http://handbook-5-1.cochrane.org/
Where to Register Protocols

- **SYREAF**: Systematic Reviews For Animals & Food
- **OSF**: Open Science Framework
  - Any topic
- **PROSPERO**: International prospective register of systematic reviews
  - Must have health related outcome
  - Longer turnaround time
The protocol for this systematic review and meta-analysis was published on the Systematic Reviews for Animals and Food (SYREAF) Web site, and the University of Guelph's atrium and can be accessed at https://atrium.lib.uoguelph.ca/xmlui/handle/10214/10486. The protocol followed the PRISMA reporting guidelines and used PRISMA items as headings.

https://doi-org/10.4315/0362-028X.JFP-18-158
Systematic Reviews: How Librarians Collaborate

Subject matter experts will
• Hand search journals and websites
• Calls to listservs or known researchers, if any

Librarian co-authors will
• Work with researchers to develop master search strategy
• “Translate” master search strategy to syntax of all databases and gray literature
• Run all database searches
• Search grey literature
• Save searches for updates
The search strategy was developed in collaboration with a librarian. A comprehensive search algorithm was developed by extracting key words and terms from 10 relevant articles and combining them into topic (e.g., “food safety” and “food hygiene”), population (e.g., handler* and employee*), intervention (e.g., intervention* and train*), and outcome (e.g., behavior* and knowledge) categories. The search was pretested in Scopus and then implemented on 22 January 2018 in eight bibliographic databases: Scopus, PubMed, CAB Abstracts, Food Safety and Technology Abstracts, PsycINFO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Hospitality & Tourism Index, and ProQuest Dissertations & Theses. No publication date or other restrictions were imposed.

https://doi.org/10.4315/0362-028X.JFP-19-108
Search Strategy Toolkit

- Use of controlled vocabulary (subject headings)
- Truncation & adjacency searching
- Search hedges
- Field searching
- Exclusion searching

FinalResult NOT ("Animals"[Mesh] NOT ("Animals"[Mesh] AND "Humans"[Mesh]))
Preparation → Retrieval → Appraisal → Synthesis → Write Up

Article Screening and Risk of Bias Assessment

Subject matter experts will
- Screen all studies retrieved from the search against eligibility criteria in two stages:
  - title & abstract screening
  - full text screening
- Perform risk of bias assessment for included studies

Librarian co-authors will
- Advise on use of article screening software like Covidence or Rayyan
- Suggest risk of bias assessment tools
Records identified through database searching (n=16700)

Additional records identified through OpenGrey (n=300)

Records after duplicates removed (n=10478)

Records screened (n=10478)

Records excluded (n=10071)

Full-text articles assessed for eligibility (n=399)

Studies included in qualitative synthesis (n=213)

Studies included in quantitative synthesis (meta-analysis) (n=202)

Full-text articles excluded, with reasons (n=186: not in English and cannot be translated=83; duplicate=25, no full text not found=4, does not involve one of the relevant foods=66, 8 do not report on prevalence under natural exposure)

11 non-English studies provided a crude estimate of prevalence in each food category via Google Translate®, but were not included in the meta-analysis
**Systematic Reviews: How Librarians Collaborate**

**Data Extraction and Synthesis**

**Subject matter experts will**
- Extract data from included studies
- Thematically characterize or quantitatively synthesize data from included studies

**Librarian co-authors will**
- Answer questions or provide guidance as needed
Systematic Reviews: How Librarians Collaborate

Subject matter experts will
- Prepare the manuscript according to submission guidelines.

Librarian co-authors will
- Write up the information retrieval methods section
- Prepare the search strategies for publication in an appendix
Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.

- PRISMA Checklist, item 8
The Google Scholar Issue

- Unknown Coverage
- Can’t sort by date
- Can’t sort by times cited
- No controlled vocabulary
- Can’t save the whole search result
- Too many results to screen
Thanks!

Any questions?

You can find me at:
- mkocher@umn.edu
Questions?

Questions can be submitted via the **Questions section** at the right of the screen.

Slides and a recording of this webinar will be available for access by IAFP members at [www.foodprotection.org](http://www.foodprotection.org) within one week.