TEXAS A&M UNIVERSITY
Libraries

AGLS Undergraduate Research Scholars Program

Scholarly Research Skills Workshop

2026-27 Cohort

Heather Adair ’90
heather.adair@tamu.edu
Associate Librarian
West Campus Library

Agenda

- The Research Process
- Topic Development & Searching
- Evaluating & Organizing Sources
- Other Considerations

The Research Process

- **Identify Your Information Need**
  - **Define** [Broad] Research Topic / Brainstorm Ideas
  - **Gather** Background Information
  - **Narrow** the Topic
  - **Draft** the Research Question (RQ)
- **Develop Search Strategy**
  - Develop a List of **Search Terms** based on the RQ
- **Determine Where to Search**
  - Google Scholar / Databases / Disciplinary Sources / Stats
- **Access, Retrieve, & Evaluate Information**
- **Organize & Synthesize Information**
- **Communicate Findings**
  - **Create** the Product (paper, presentation, infographic, etc.)
  - Contribute to the Scholarly Conversation
  - **Cite** your Sources

Identify your need for information, clearly name the topic and scope

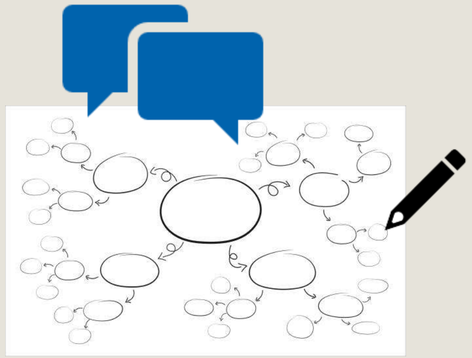
Determine how you will find and evaluate the information

Apply your new knowledge to create a product; acknowledge source(s)

TEXAS A&M UNIVERSITY Libraries

Brainstorming Activity

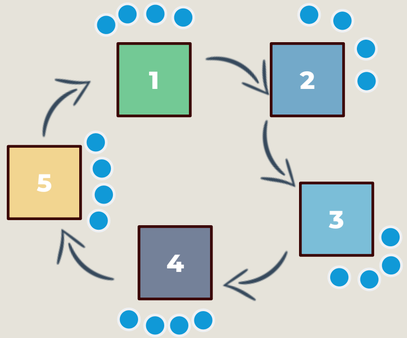
Groups of 2-3



Ponder, Discuss, & Map

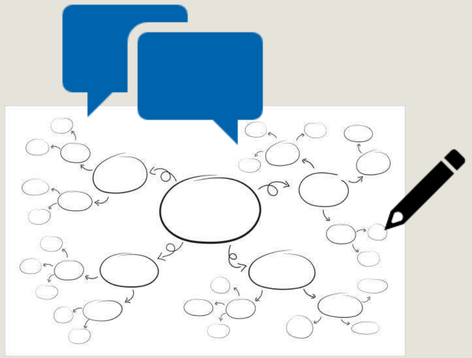
1. Agree on a Topic
2. Draw a Mind Map of your Topic
3. Brainstorm the potential characteristics, attributes, impact, or other aspects key features

Consider species, population, geography, environment, economic impact, human impact, the good & the bad, the type of study or methodology, etc.



Peer Feedback

- Provide constructive feedback on other groups' mind maps
- What is missing?
  Or unclear?
  What resonates with you?



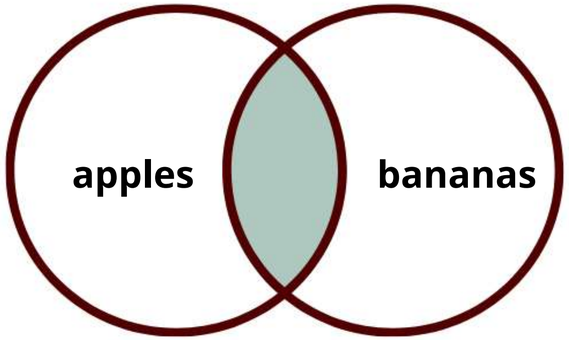
Review & Adjust

1. Review the feedback & Adjust if needed
2. Select a pathway or components to focus your search process
   - CIRCLE your non-negotiables
   - Star ★ synonyms
   - X or ~~cross out~~ your exclusions

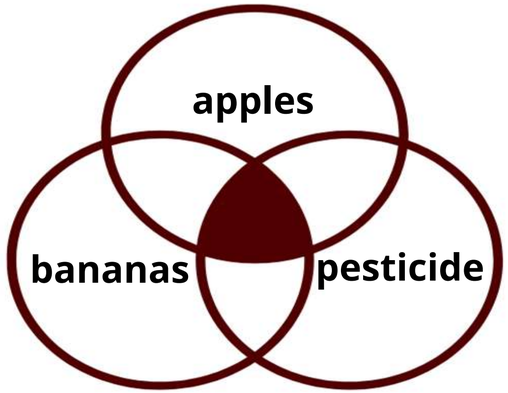
Boolean Operators & Searching

Constructing Search Strings

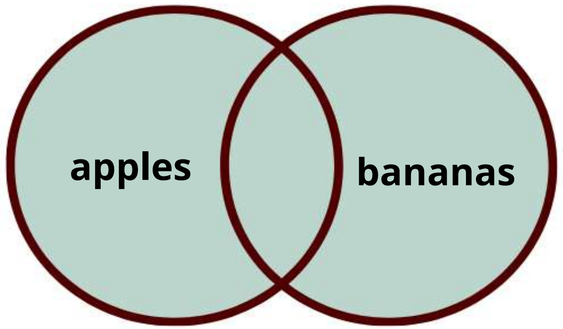
apples **AND** bananas



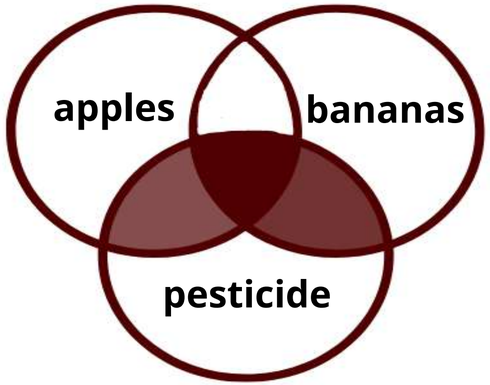
apples **AND** bananas **AND** pesticide

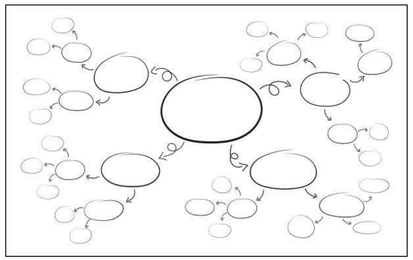


apples **OR** bananas



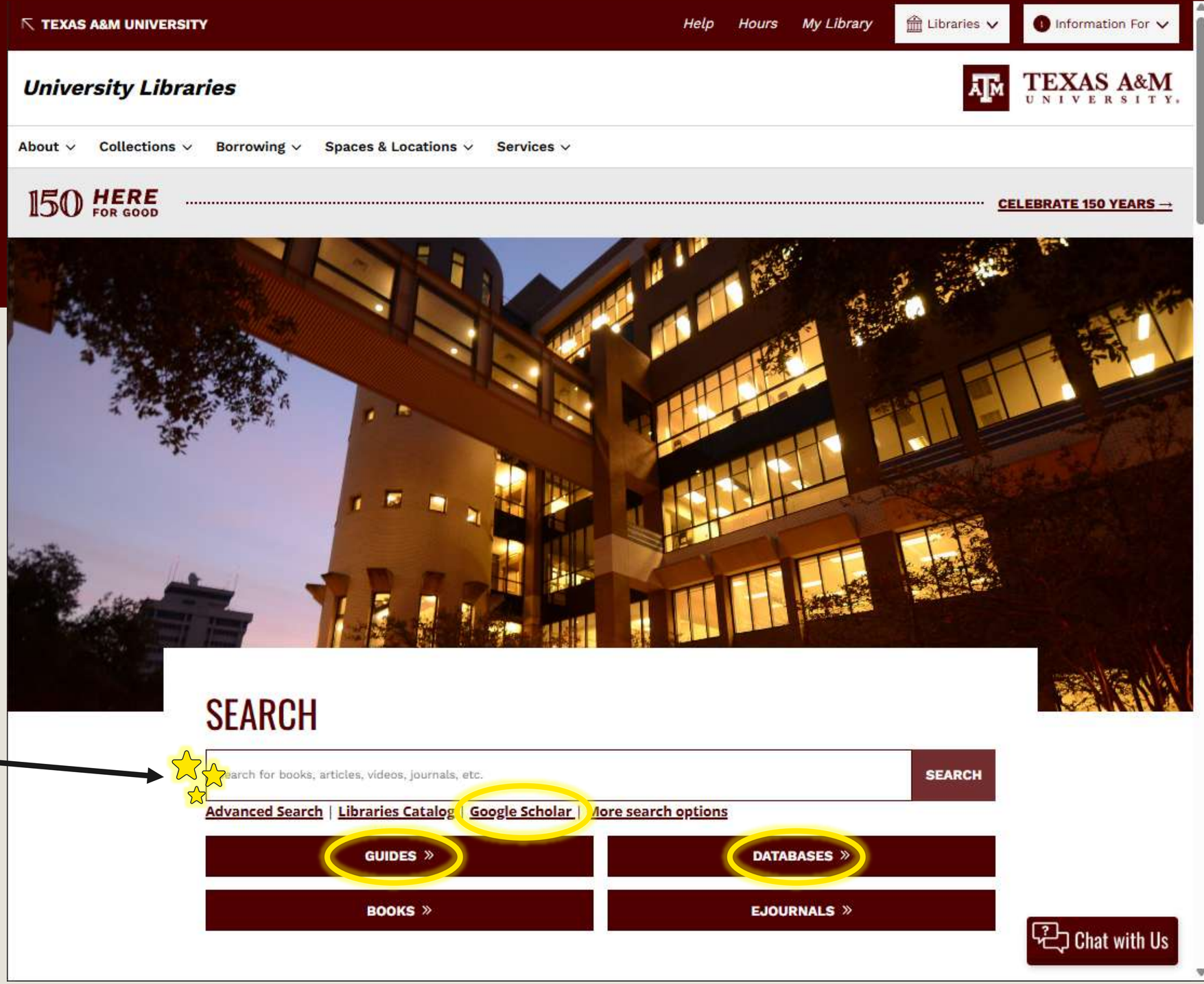
(apples **OR** bananas) **AND** pesticide

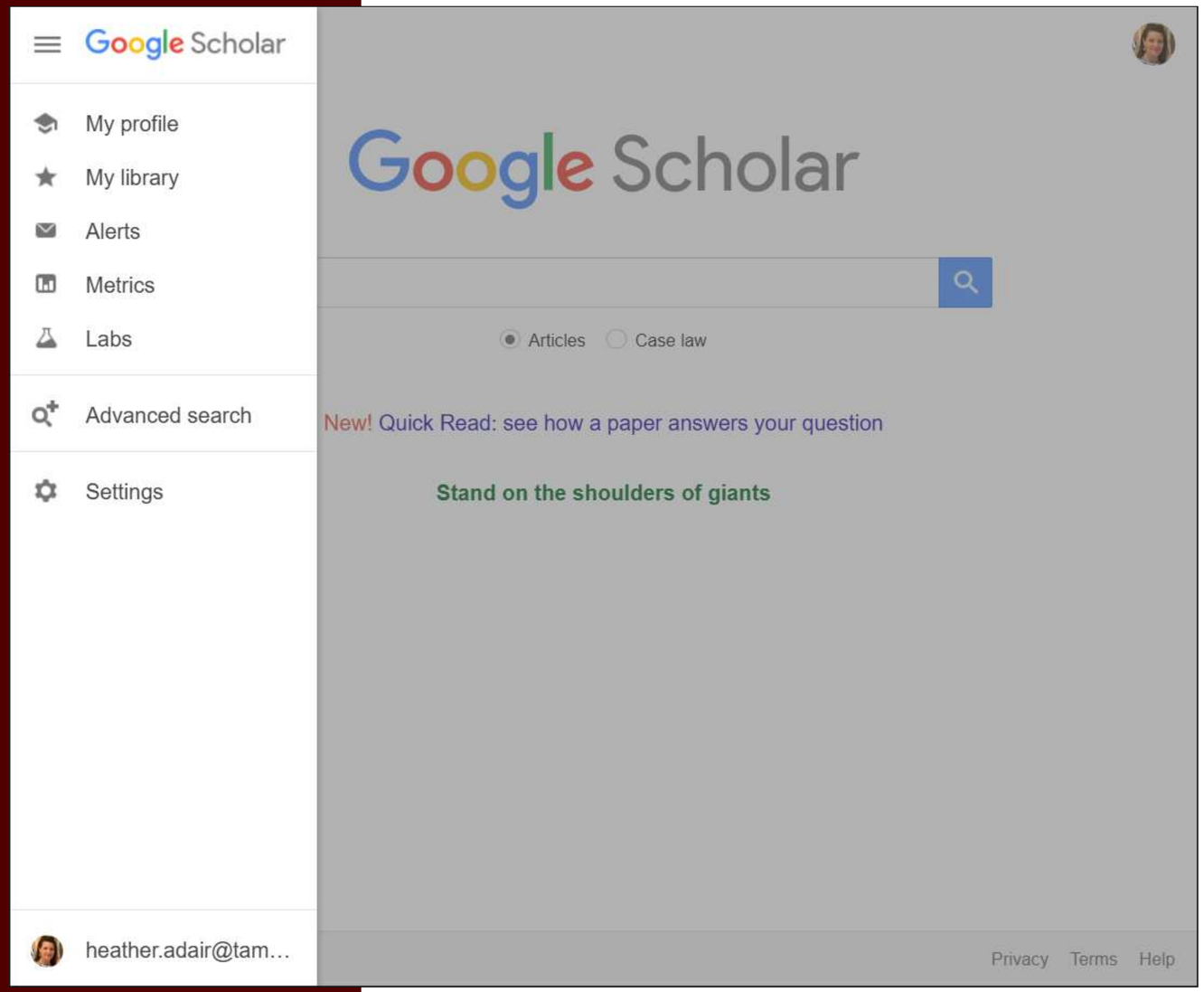




Analyze

1. Which words in your mind map are **non-negotiable**? **[AND]**
2. Which words have synonyms or **similar meanings** or categorizations? **[OR]**
3. Which words do you want to **exclude** in your search? **[NOT]**


TEXAS A&M UNIVERSITY
Help
Hours
My Library
Libraries
Information For
University Libraries
TEXAS A&M UNIVERSITY
About
Collections
Borrowing
Spaces & Locations
Services
150 HERE FOR GOOD
CELEBRATE 150 YEARS →
SEARCH
earch for books, articles, videos, journals, etc.
SEARCH
Advanced Search | Libraries Catalog | Google Scholar | More search options
GUIDES »
DATABASES »
BOOKS »
EJOURNALS »
Chat with Us

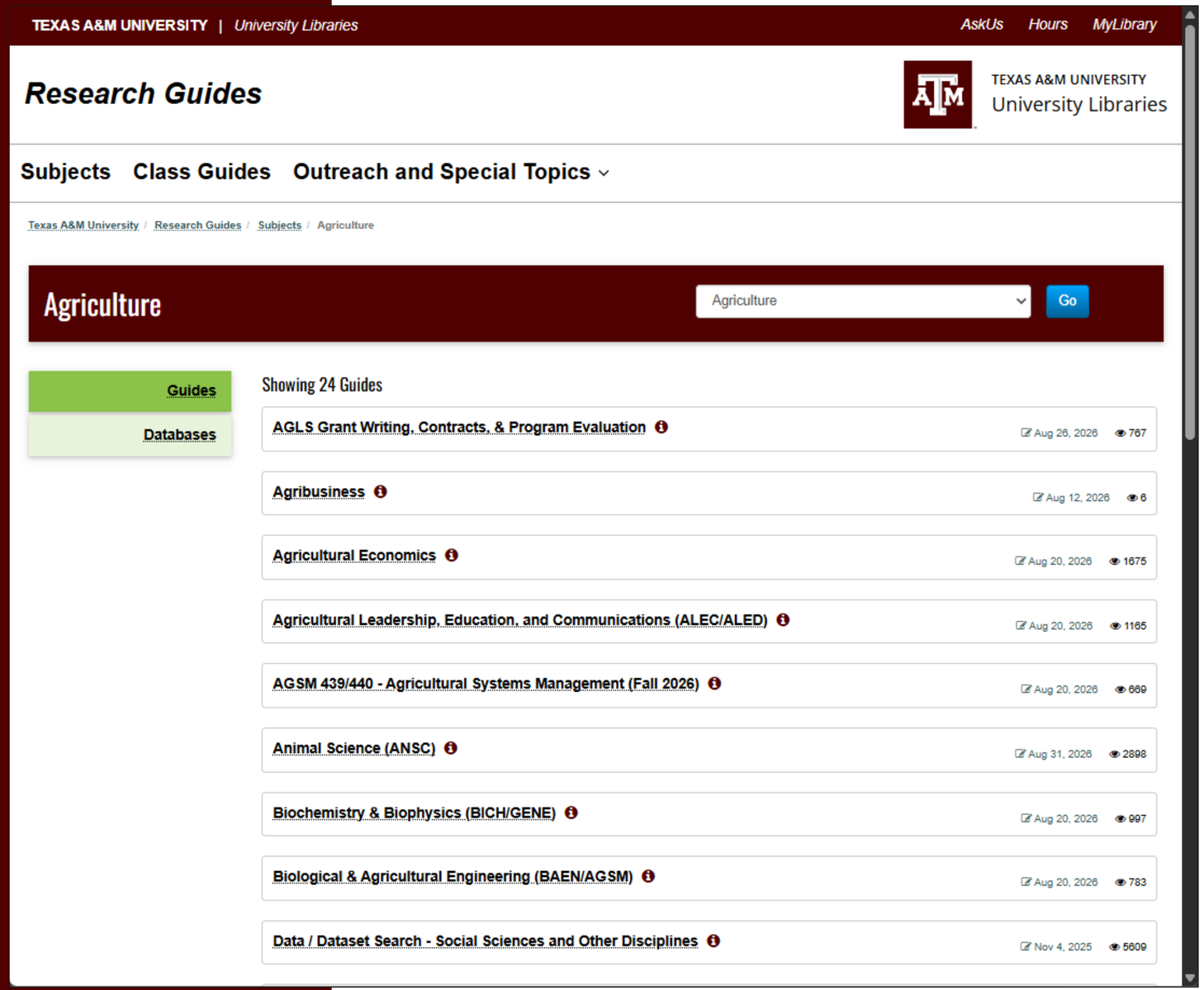


(A&M's) Google Scholar

Access via library.tamu.edu

- *Links to A&M Library subscription resources AND free, publicly available resources*

TEXAS A&M UNIVERSITY Libraries



Agriculture Subject & Class Guides

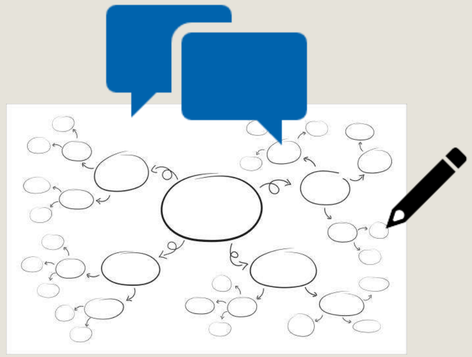
tamu.libguides.com/ag

A *starting point* for resources

TEXAS A&M UNIVERSITY Libraries

Constructing Searches & Testing Strings

Same Groups



We will Use Terms from your Mind Maps as a Guide

Experimentation

- Access your group's assigned search platform
- Together, we will experiment with search strings (or "sentences") and discuss the results

Where or How Else Can I Look?

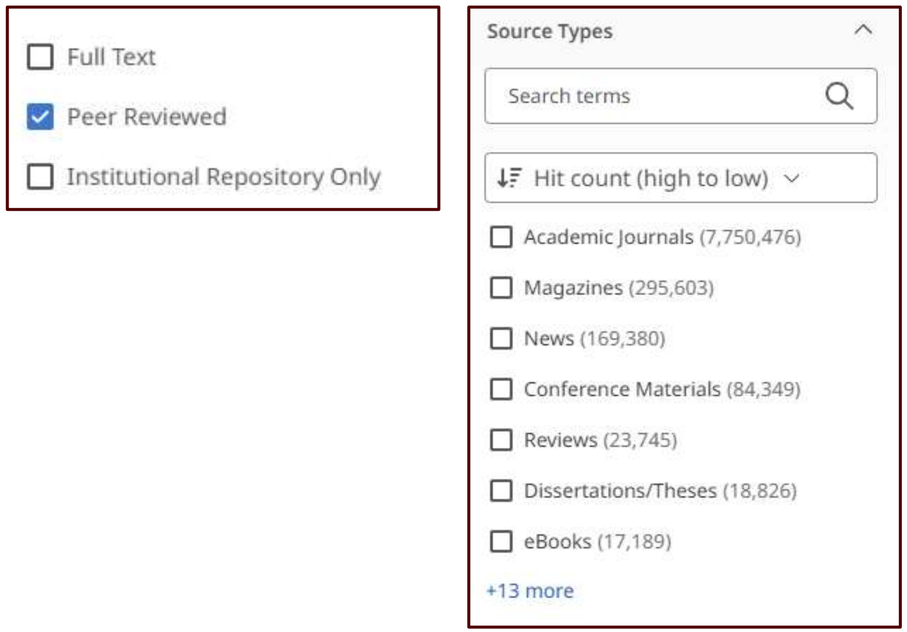
- **AgriLife Publications**
- **USDA, UNESCO, and other government sites**
- **Professional Organizations**
- **LinkedIn**

- **Lean into the power of Boolean operators.**
  - *Don't want reviews or meta-analyses in your results? Add:*
    NOT (review OR "meta-analysis" OR "systematic review")
  - *Looking for original research? Add:*
    AND (methodology OR "empirical study" OR quantitative OR qualitative OR interview OR survey OR experiment)
  - *Include synonyms, including scientific names and alternate spellings. Ex:*
    "Cochliomyia hominivorax" OR "new world screwworm"
- **Scrub references backward AND forward AND alongside**
  - *Backward* – check the reference list of the paper you're looking at
  - *Forward* – check the "cited by" list in Google Scholar or Library Search Results to see who cited the paper after it was published
  - *Alongside* – check for a "related articles link"; these may be similar

Is it Scholarly?

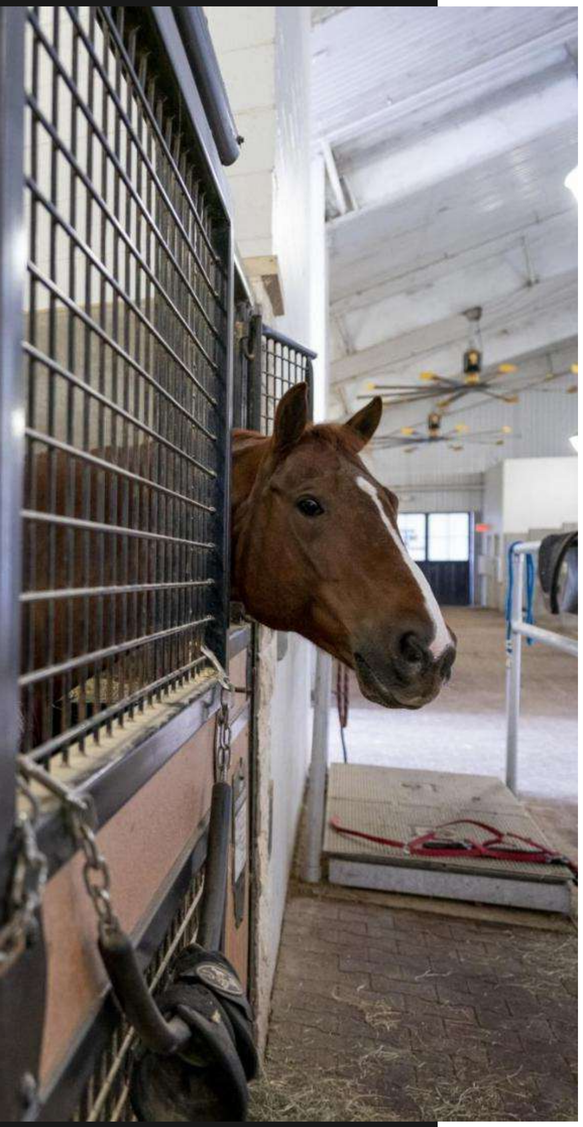
Option 1:

- Use the Database filters
- Presentation varies by Database



Option 2:

- Check UlrichsWeb
  aka *Ulrich's Periodical Directory*
- Search by *Journal Title*



Other Considerations

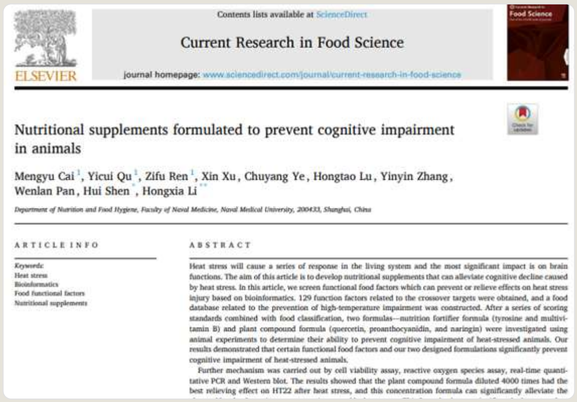
- **How do I know if it is original research or a review paper?**
  - Does it matter? Why?

- **Review or Original?**
  - “We measured…” < original
  - “Published studies agree…” < review
  - “This review examines…” < review
  - “Our results show…” < original
  - “We synthesized recent advances in…” < review
  - “We investigated the effects of…” < original
  - “In this study, [species] was treated with…” < original

** Be careful – systematic reviews may use the same language as scoping reviews and review articles*

Dissecting a Scholarly Article

1 Abstract



Contents lists available at ScienceDirect

Current Research in Food Science

journal homepage: www.sciencedirect.com/journal/current-research-in-food-science

Nutritional supplements formulated to prevent cognitive impairment in animals

Mengyu Cai, Yicui Qu, Zifu Ren, Xin Xu, Chuyang Ye, Hongtao Lu, Yinyin Zhang, Wenlan Pan, Hui Shen *, Hongxia Li **

Department of Nutrition and Food Hygiene, Faculty of Naval Medicine, Naval Medical University, 200433, Shanghai, China

ARTICLE INFO

Keywords:
Heat stress
Bioinformatics
Food functional factors
Nutritional supplements

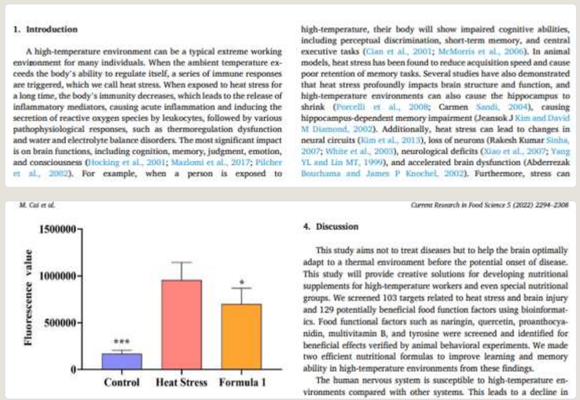
ABSTRACT

Heat stress will cause a series of response in the living system and the most significant impact is on brain functions. The aim of this article is to develop nutritional supplements that can alleviate cognitive decline caused by heat stress. In this article, we screen functional food factors which can prevent or relieve effects on heat stress injury based on bioinformatics. 129 function factors related to the crossover targets were obtained, and a food database related to the prevention of high-temperature impairment was constructed. After a series of scoring standards combined with food classification, two formulas—nutrition fortifier formula (tyrosine and multivitamin B) and plant compound formula (quercetin, proanthocyanidin, and naringin) were investigated using animal experiments to determine their ability to prevent cognitive impairment of heat-stressed animals. Our results demonstrated that certain functional food factors and our two designed formulations significantly prevent cognitive impairment of heat-stressed animals.

Further mechanism was carried out by cell viability assay, reactive oxygen species assay, real-time quantitative PCR and Western blot. The results showed that the plant compound formula diluted 4000 times had the best relieving effect on HT22 after heat stress, and this concentration formula can significantly alleviate the

- Preview of article
- Purpose of study
- Type of study
- Glimpse into findings

2 Intro & Conclusion



1. Introduction

A high-temperature environment can be a typical extreme working environment for many individuals. When the ambient temperature exceeds the body's ability to regulate itself, a series of immune responses are triggered, which we call heat stress. When exposed to heat stress for a long time, the body's immunity decreases, which leads to the release of inflammatory mediators, causing acute inflammation and inducing the secretion of reactive oxygen species by leukocytes, followed by various pathophysiological responses, such as thermoregulation dysfunction and water and electrolyte balance disorders. The most significant impact is on brain functions, including cognition, memory, judgment, emotion, and consciousness (Hocking et al., 2001; Mazloomi et al., 2017; Pilcher et al., 2002). For example, when a person is exposed to high-temperature, their body will show impaired cognitive abilities, including perceptual discrimination, short-term memory, and central executive tasks (Qian et al., 2001; McMorris et al., 2006). In animal models, heat stress has been found to reduce acquisition speed and cause poor retention of memory tasks. Several studies have also demonstrated that heat stress profoundly impacts brain structure and function, and high-temperature environments can also cause the hippocampus to shrink (Porcelli et al., 2008; Carmen Sandi, 2004), causing hippocampus-dependent memory impairment (Jeansok J Kim and David M Diamond, 2002). Additionally, heat stress can lead to changes in neural circuits (Kim et al., 2013), loss of neurons (Rakesh Kumar Sinha, 2007; White et al., 2003), neurological deficits (Xiao et al., 2007; Yang YL and Lin MT, 1999), and accelerated brain dysfunction (Abderrezak Bouchama and James P Knochel, 2002). Furthermore, stress can

M. Cai et al. Current Research in Food Science 5 (2022) 2294–2308

4. Discussion

This study aims not to treat diseases but to help the brain optimally adapt to a thermal environment before the potential onset of disease. This study will provide creative solutions for developing nutritional supplements for high-temperature workers and even special nutritional groups. We screened 103 targets related to heat stress and brain injury and 129 potentially beneficial food function factors using bioinformatics. Food functional factors such as naringin, quercetin, proanthocyanidin, multivitamin B, and tyrosine were screened and identified for beneficial effects verified by animal behavioral experiments. We made two efficient nutritional formulas to improve learning and memory ability in high-temperature environments from these findings.

The human nervous system is susceptible to high-temperature environments compared with other systems. This leads to a decline in

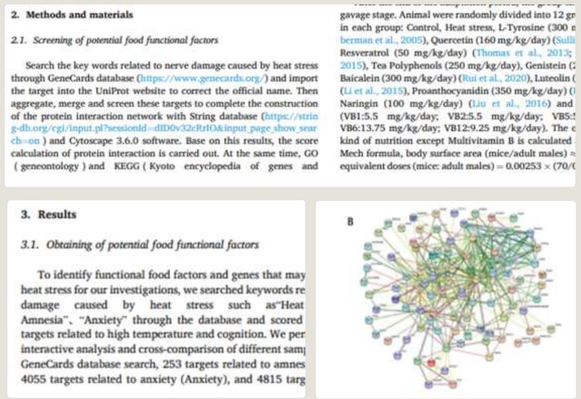
Intro:

- Background information
- What authors learned through their research

Conclusion / Discussion:

- Summary of findings
- Answered questions
- Potential areas of study

3 Methods & Results



2. Methods and materials

2.1. Screening of potential food functional factors

Search the key words related to nerve damage caused by heat stress through GeneCards database (https://www.genecards.org/) and import the target into the UniProt website to correct the official name. Then aggregate, merge and screen these targets to complete the construction of the protein interaction network with String database (https://string-db.org/cgi/input.pl?sessionId=dfD0v32cRrIO&input_page_show_search=on) and Cytoscape 3.6.0 software. Base on this results, the score calculation of protein interaction is carried out. At the same time, GO (geneontology) and KEGG (Kyoto encyclopedia of genes and

gavage stage. Animal were randomly divided into 12 gr
in each group: Control, Heat stress, L-Tyrosine (300 n
berman et al., 2005), Quercetin (160 mg/kg/day) (Sulli
Resveratrol (50 mg/kg/day) (Thomas et al., 2013;
2015), Tea Polyphenols (250 mg/kg/day), Genistein (2
Baicalein (300 mg/kg/day) (Rui et al., 2020), Luteolin (
(Li et al., 2015), Proanthocyanidin (350 mg/kg/day) (
Naringin (100 mg/kg/day) (Liu et al., 2016) and
(VB1:5.5 mg/kg/day; VB2:5.5 mg/kg/day; VB5:5
VB6:13.75 mg/kg/day; VB12:9.25 mg/kg/day). The c
kind of nutrition except Multivitamin B is calculated
Mech formula, body surface area (mice/adult males) ≈
equivalent doses (mice: adult males) = 0.00253 × (70/(

3. Results

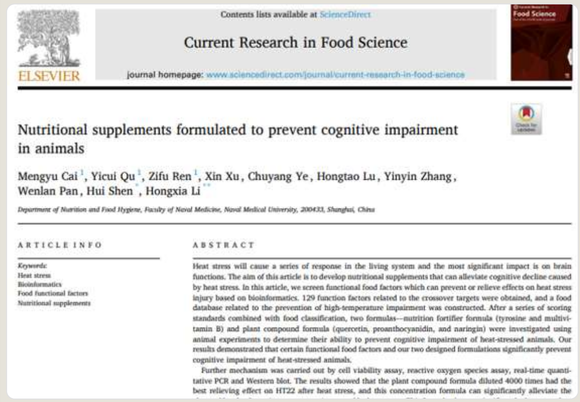
3.1. Obtaining of potential food functional factors

To identify functional food factors and genes that may
heat stress for our investigations, we searched keywords re
damage caused by heat stress such as"Heat
Amnesia"、"Anxiety" through the database and scored
targets related to high temperature and cognition. We per
interactive analysis and cross-comparison of different samp
GeneCards database search, 253 targets related to amnes
4055 targets related to anxiety (Anxiety), and 4815 targ

B

- Study construction
- Visualization of data
- Explanation of findings
- Is it a replication study? Can it be replicated?
- Does it make sense?
- Do you have questions?

4 Read the Article



Contents lists available at ScienceDirect

Current Research in Food Science

journal homepage: www.sciencedirect.com/journal/current-research-in-food-science

Nutritional supplements formulated to prevent cognitive impairment in animals

Mengyu Cai, Yicui Qu, Zifu Ren, Xin Xu, Chuyang Ye, Hongtao Lu, Yinyin Zhang, Wenlan Pan, Hui Shen *, Hongxia Li **

Department of Nutrition and Food Hygiene, Faculty of Naval Medicine, Naval Medical University, 200433, Shanghai, China

ARTICLE INFO

Keywords:
Heat stress
Bioinformatics
Food functional factors
Nutritional supplements

ABSTRACT

Heat stress will cause a series of response in the living system and the most significant impact is on brain functions. The aim of this article is to develop nutritional supplements that can alleviate cognitive decline caused by heat stress. In this article, we screen functional food factors which can prevent or relieve effects on heat stress injury based on bioinformatics. 129 function factors related to the crossover targets were obtained, and a food database related to the prevention of high-temperature impairment was constructed. After a series of scoring standards combined with food classification, two formulas—nutrition fortifier formula (tyrosine and multivitamin B) and plant compound formula (quercetin, proanthocyanidin, and naringin) were investigated using animal experiments to determine their ability to prevent cognitive impairment of heat-stressed animals. Our results demonstrated that certain functional food factors and our two designed formulations significantly prevent cognitive impairment of heat-stressed animals.

Further mechanism was carried out by cell viability assay, reactive oxygen species assay, real-time quantitative PCR and Western blot. The results showed that the plant compound formula diluted 4000 times had the best relieving effect on HT22 after heat stress, and this concentration formula can significantly alleviate the

- Read & take notes
- Summarize sections in your own words
- Note references/sources you may want to check out for further reading

Citation Management

Citation management software (or citation managers) helps you collect, organize, and format references to articles, books, and other publications during the research and writing process.

EN Guide

RefWorks

RefWorks Guide

Zotero Guide

Upcoming Citation Management Workshops

Writing & Citing Guide
Writing Center Resources

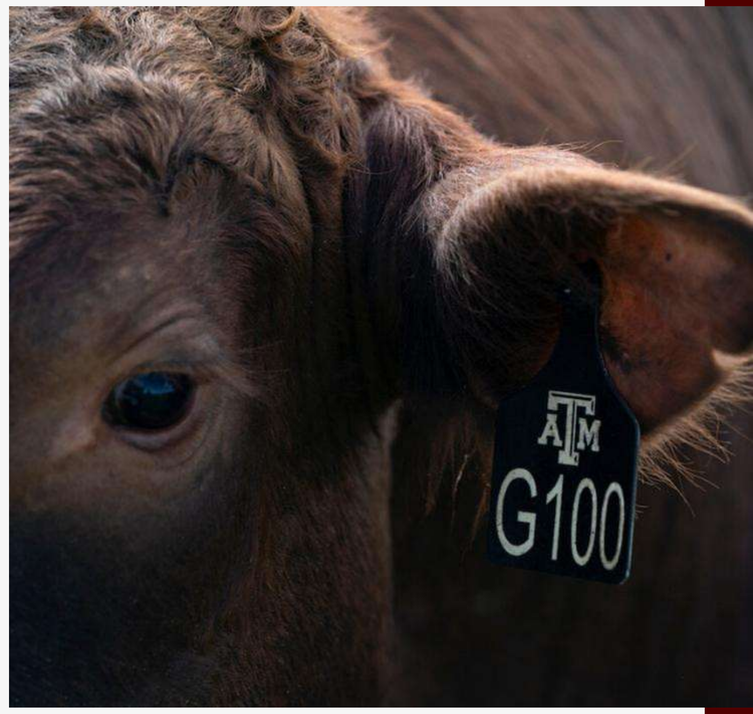
TEXAS A&M UNIVERSITY
Libraries

AskUs

tx.ag/AskUs

library.tamu.edu
tx.ag/HowDoYouLibrary
tamu.libguides.com/ag

writingcenter.tamu.edu



Heather Adair ’90
heather.adair@tamu.edu
Associate Librarian
West Campus Library