



# NASA Food Technology Commercial Space Center

## Information: What is True?

### Food Irradiation: What is Safe? by Kevan Flaming

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#### LESSON SUMMARY

This lesson is focused on food irradiation. It could easily be adapted to any controversial topic.

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#### STUDENT LEARNING OUTCOMES

1. Students will create information validity rules and use them to rank information sources both individually and as part of a group. This will expose their prior knowledge about information validity.
  2. Students will compare and contrast their rules with a set of expert derived rules and develop an “improved” set of information validation rules.
  3. Student will apply the new set of information validation rules to various source material (web sites).
  4. Students will summarize multiple arguments and analyze the validity of the information cited in the arguments.
  5. Students will judge which side of the food irradiation issue is most true and support their position.
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#### ASSESSMENT/ EVALUATION

The assessment for this lesson could be a written document as suggested in this lesson. Another option would be to conduct an academic controversy on the topic the following class period.

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#### MATERIALS

- 30- 60 minutes class time.
  - Willingness to have students work in small groups and to facilitate whole class discussions.
  - List of specific and general sources (projected or handed out). See below.
  - Questions to consider after ranking (projected or handed out). See below.
  - Students need access to the web to explore the selected websites.
  - Handout of expert rules for **Judging the Validity of Information** (available at end of lesson)
  - Hamburger crumbles – irradiated and not irradiated - for taste testing - optional (instructions in “End of lesson activities” below )
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**INSTRUCTIONS  
GIVEN TO  
STUDENTS**

**Introduce the topic to students:**

We are going to explore the topic of food irradiation. There are groups that argue food irradiation is safe and should be used to improve food safety. There are other groups that argue food irradiation poses a significant safety risk and should not be used. Who is right?

First let's consider the general reliability of information sources.

**Assign the students to groups of 2-4.**

Project the Specific Information Source List and directions (or provide handouts)

Ask students to rank order the list (give them time to do it individually first, then to discuss it with their group) (may want to have the list on strips of paper for the groups to facilitate physically ordering the list).

**Directions to Students:**

Please rank these information sources in order from most to least reliable. If there are several sources that you consider equally reliable list them at the same rank. For our purposes consider the source's reliability related to food irradiation.

**Specific Information Source List**

1. An article in Science or Nature
2. An editorial in the New York Times Newspaper
3. A news article in the Ames Tribune (local paper)
4. An article in the National Enquirer
5. Information published by the Centers for Disease Control (web site)
6. A news story on 60 Minutes
7. A news story on the local Channel 5 evening news (Ames IA)
8. Vin Diesel
9. Barbara Streisand
10. The checker at Hy-Vee (grocery store)
11. Information from an "Activist" or special interest group
12. A website from a company that builds food irradiation equipment
13. A publication from a State University Extension service

**Repeat this activity with the General Information Source List** if time allows

By ranking both the specific and general lists the students should have an easier time identifying the information validation rules they are using.

**General Information Source List**

1. Peer reviewed original research
2. Peer reviewed reviews or summaries
3. Newspapers
4. Tabloids

5. Popular magazines
6. A governmental agency
7. A university
8. An expert or group of experts
9. An interest group or activist group
10. An independent individual without expert status
11. A conversation overheard in a restaurant (or bulletin board / list serve)
12. A celebrity (one you like)
13. A sales representative for the product/service of interest

**Group Assignment: Questions to consider after ranking**

1. What rules did you use when ranking the list? What criteria were used to decide the credibility of a source?
2. Would you rank the list the same way for all topics? For example:
  - a. Best car to buy
  - b. Best place to vacation
  - c. A new health recommendation
  - d. A new cancer treatment
  - e. The environmental effects or lack of effects of the use of a herbicide in corn production in Iowa
  - f. A new flea treatment
  - g. A new antibiotic.
3. How would your ranking differ for varying topics? Would you use the same rules as in #1?
4. Are any of these sources always right? Do you know of examples where each was wrong? Are any of these sources always not credible? Is it possible that a source at the bottom of your list might be correct while a source near the top could be wrong on the same issue? Why or why not?

**Instructor Directions:**

Specify a recorder for each group (e.g. person whose birth date would come first in the year on or after Jan 1). Ask each group to submit a ranked list for the Specific and/or General Sources with their answers to Questions #1 and #2.

After each group turns in their ranking and their answers to questions #1 & #2 give them the handout “Judging the Validity of Information”. Ask them to compare their rules with those provided.

**Directions to Students for “Judging the Validity of Information”**

**Handout:**

Students should specifically identify:

- Rules they suggested that are not encompassed in those provided
- Rules on the provided list they do not understand (e.g. Peer review; primary vs secondary vs tertiary sources)

- Rules they disagree with
- Rule on the expert list that they did not identify
- A final “improved” set of information validation rules.

Then ask students to identify which rules should be applied to each of the items on the original list that they ranked. Ask each group to re-rank the list based upon their new set of rules.

In a brief lecture or in the general class discussion emphasize that these rules are guidelines that are true in general but might not be true in specific. (need some negative examples – for example the recent [made up stories in NY Times](http://www.nytimes.com/2012/01/26/us/politics/26made-up.html) by Jayson Blair <http://slate.msn.com/id/2082741/> ) Ask groups to give examples of how their lists changed from their first ranking to their second ranking.

### **Assignment for next class**

Review at least two web sites for and two against food irradiation. Prepare a summary of the arguments for and against the irradiation of food. You should prepare approximately a 1 page outline summary for each side. On a separate (attached) sheet of paper state which side you personally support (you have to choose one or the other). Indicate why you believe that argument to be more credible and why you believe the other side to be less credible.

#### **a. Web Sites supporting Food Irradiation:**

- <http://www.extension.iastate.edu/foodsafety/irradiation/index.cfm?parent=3>
- [http://www.food-irradiation.com/Derr\(ed\).htm](http://www.food-irradiation.com/Derr(ed).htm)
- <http://ccr.ucdavis.edu/irr/oppose.shtml>

#### **b. Web Sites opposing Food Irradiation:**

- [http://www.citizen.org/cmep/foodsafety/food\\_irrad/](http://www.citizen.org/cmep/foodsafety/food_irrad/)
- <http://www.pure-food.com/food.htm>
- <http://www.organicconsumers.org/irrad/ForStudents.cfm#FactSheets>

### **End of lesson activities**

- Wrap Up / summarize students choices (show of hands)
- Make irradiated hamburger crumbles available for tasting.
  - Purchase both regular and irradiated hamburger at grocery store
  - Crumble and cook in skillet in advance, keep warm in crock pots
  - Serve in small cups.
- You could have an [Academic Controversy](#) on the second day. This is an activity where students debate both sides of an issue. See <http://clte.asu.edu/active/acadcontr.pdf> for a good description of the process.
- You can tell the students which side of the topic you have chosen – and why

- This assignment would be best supported if future assignments / discussions come back to information validity and evaluating it.
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**LEGEND:**

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— **COMMUNICATION MATERIALS**

— **PROJECT LEARN MATERIALS**

— **Instructor Materials**

## Judging the Validity of Information

| Higher Credibility   | Criteria                 | Lower Credibility   |
|--|--------------------------|---|
| Degree / Title Has done recognized work in area                                    | Credentials / Experience | No degree or title or experience  |
| Neutral organization and/or a Group with a history of correct unbiased information | Affiliation              | Group with a strong bias and/or a Group with a history of incorrect or biased information                                     |
| Reviewed by “expert” 3 <sup>rd</sup> parties prior to publication                  | Peer review              | No review   |
| Data from original research or first-hand experience of event                      | Original Source          | Tertiary source that relies on secondary sources that comment / interpret the primary sources                                 |
| No direct stake in the issue (neutral party)                                       | Conflict of Interest     | Someone with a strong financial (or other) stake in the issue   |
| Recent, but old enough to be tested  | Date                     | Old and out of date or<br>Brand new and untested  |
| History of previous recognized work in same or similar area                        | Reputation (other work)  | History of incorrect information in same or similar area<br>No relevant history   |
| Recognized by many other credible sources  | Citations of others      | Not recognized by other credible sources<br>or<br>Recognized as a provider of incorrect information by other credible sources |

**Primary Source:** One that reports original research or first-hand experience of the event.

**Secondary Source:** One that reports based on a review of primary sources.

**Tertiary Source:** One that reports based on secondary sources of information.