Name: _____ Date: _____ Class: _____

Backgrounder Assignment Topic 2: Technology and the Food Irradiation Process

Use the websites below to research food irradiation, food safety and food-borne illnesses. Your group will pay special attention to the **technology** and the food irradiation process aspects of these three topics. Based on your research, your group is to work together to create a single-page (maximum of 250 words) backgrounder which will be used to help your classmates understand this aspect of this issue (see the **Food Irradiation Individual Writing Assignment BLM** for more information).

Below are some questions to help guide your research.

- How is food irradiated?
- Does irradiation make food radioactive? Why or why not?
- What other technological processes are similar to food irradiation?
- Does Canada have a good supply of the radioisotope it needs for food irradiation?
- Why does ionizing radiation kill insects, bacteria and other microorganisms?
- Does food irradiation also kill the cells in the food itself?
- Can food irradiation kill food-borne viruses?
- Other than preventing food poisoning, what are the other benefits of food irradiation?
- Does food irradiation technology guarantee the safety of the public from food-borne illnesses?

Web links
(Retrieved Aug. 1, 2019)

- **Food Irradiation – Canadian Nuclear Association**
  A look at how food irradiation works, it's benefits, safety practices and where it's happening around the world.

- **Causes of Food Poisoning – Canadian Food Inspection Agency, Government of Canada**
  Links to information about common causes of food poisoning, including listeria.

- **Food Irradiation – Canadian Food Inspection Agency, Government of Canada**
  Food irradiation, labelling, types of foods irradiated in Canada and food safety.

- **Irradiated foods – Canadian Food Inspection Agency, Government of Canada**
  Requirements and controls for handling and labelling irradiated foods in Canada.

- **Food Irradiation – Health Canada, Government of Canada**
  Information on foods that are currently irradiated in Canada and answers to frequently asked questions.

- **Food-Related Illnesses – Health Canada, Government of Canada**
  A look at common causes of food-related illnesses including infant botulism, listeriosis and

salmonellosis.

- **Policy on Listeria monocytogenes in Ready-to-Eat Foods – Health Canada, Government of Canada**
  This policy outlines the roles and responsibilities of government, industry and consumers in regard to listeria and food safety.

- **Listeriosis (Listeria) – Health Canada, Government of Canada**
  Causes, symptoms, risks, treatment, prevention, surveillance information and guidance for health professionals.

- **Lessons Learned: Public Health Agency of Canada's Response to the 2008 Listeriosis Outbreak – Public Health Agency of Canada, Government of Canada**
  Release of the Lessons Learned Report in the 2008 listeriosis outbreak (archived).

Backgrounder Assignment Topic 2: Technology and the Food Irradiation Process – Suggested Responses

Below are suggested answers for the guiding questions.

- How is food irradiated?
  - *Food is irradiated similar to the way luggage is x-rayed at airports. The food is passed through a thick-walled chamber containing a source of ionizing radiation that passes through the food, destroying insects, bacteria and microorganisms.*

- Does irradiation make food radioactive? Why or why not? (See the section on cobalt-60 therapy units below.)
  - *No, irradiated foods do not become radioactive. When something has been irradiated, by x-rays, gamma rays or electron beams, the irradiation stops as soon as the source of ionizing radiation has been removed or terminated. Food would only become radioactive if contaminated. When radioactive contamination has occurred, the source of the ionizing radiation itself is transferred.*

- What other technological processes are similar to food irradiation?
  - *Food irradiation uses the same radioisotope (cobalt-60) and a similar process to cobalt-60 therapy units.*

- Does Canada have a good supply of the radioisotope it needs for food irradiation?
  - *Cobalt-60, the radioisotope most commonly used in food irradiation, is produced in CANDU reactors in Ontario and New Brunswick.*

- Why does ionizing radiation kill insects, bacteria and other microorganisms?
  - *With sufficient ionizing radiation, cells are killed. The death of one cell is of no concern, but if too many cells die at once the organism will die.*

- Does food irradiation also kill the cells in the food itself?
    - *Yes, all living cells in the food are killed. This causes changes in the food similar to cooking and some irradiated foods may taste slightly different because of this.*

- Can food irradiation kill food-borne viruses?
    - *Viruses are not, for the most part, destroyed by the radiation levels that are suitable for use in foods.*

- Other than preventing food poisoning, what are the other benefits of food irradiation?
    - *Food irradiation can prevent spoilage by destroying bacteria, molds and yeast which cause food to spoil and by controlling insect and parasite infestation. It can also increase shelf life by slowing ripening or sprouting in fresh fruits and vegetables, such as potatoes and onions.*

- Does food irradiation technology guarantee the safety of the public from food-borne illnesses?
    - *No. Nothing can guarantee food safety, but food irradiation greatly reduces bacteria and other microorganisms that may be present in food. Irradiated food must still be handled, stored and cooked properly like all other foods. The rules of safe food handling – proper sanitation, packaging, storage and preparation – still need to be followed.*