

Name samples of excellent student responses Rec. Section 8:30 11:00 12:30**Do your own work. Closed book and notes. Please do not talk to your neighbors for part II.****You may earn up to 6 bonus points**I. (3 pts) -- *In a memo dated 11/9/00, the UNL Environmental Health and Safety Office uses this description of Gamma rays:*

"Radioactive waves of energy that originate from change in the atom's nucleus."

Discuss this definition with two other people, and write your own short (2 or 3 sentence) critique. Be clear about what seems reasonable in the definition, and what doesn't. Can you write a better description of gamma radiation?

Partners: _____

This definition is incorrect in stating that gamma rays are radioactive themselves; they are the results of the radioactivity of the radioactive element. Gamma radiation is a photon released from the radioactive decay of an element's nucleus.

II. (3 pts) Dateline Paris, France -- Le Monde -- April 21, 2000 (adapted from a true story)

The "mad cow" disease that seemed to infect the cattle of Great Britain has, so far, been prevented from reaching France. In order to continue the "mad cow"-free condition of cattle in France, France's Bureau of Health has banned the importation of all beef and dairy products from Britain.

British cattle farmers have claimed that this is unfair discriminatory practice. They have offered to have all beef and dairy products irradiated by ionizing gamma radiation to kill any "mad cow" germs in their products. They claim that such irradiated products would be completely safe for consumers in France, and that they will be tasty.

The farming cooperatives of Frances have urged the French government to ban any such radioactive beef and dairy products from their country. Importation of these products from England is likely to result in lower prices for French consumers of beef and dairy products.

Because of the expertise you demonstrated in Physics 142 you have been hired by the French government to make a recommendation on this dispute. What do you recommend? Be sure to explain your recommendation for people who might not understand ionizing radiation as well as you do.

Irradiation, whether effective at destroying the "mad cow" prion (a protein not a germ) is not going to be relevant. The issue here is that people fear the beef becoming radioactive. Simply irradiating the beef will not cause it to become radioactive, so this won't pose a threat to consumers. However, if the radiation isn't effective at destroying the "mad cow" protein, then "mad cow" disease could pose a threat. Before a final decision on this subject is made the effectiveness of gamma radiation on "mad cow" disease proteins would need to be determined.