

April 9, 2003

Livestock and Seed Programs  
Agricultural Marketing Service  
U.S. Department of Agriculture  
Stop 0249, Room 2092-S  
Washington, DC 20250-0249  
Email: [foodsafetytechnology@usda.gov](mailto:foodsafetytechnology@usda.gov)

HAND DELIVERED AND EMAILED

Re: Public Comment on 2002 Farm Bill Food Safety Technologies Provision

Dear Sir or Madam:

The Center for Food Safety (CFS), a non-profit consumer organization, would like to comment on the United States Department of Agriculture's efforts to implement the provisions of Section 4201 (b) (3) of the Farm Security and Rural Investment Act of 2002 (Farm Bill) – "Use of Approved Food Safety Technologies." CFS, together with Public Citizen, filed earlier comments, dated December 18, 2002, opposing the proposal on several grounds, procedural and substantive, including serious safety issues stemming from scientific studies indicating that certain irradiated foods may cause mutagenic, genotoxic, cytotoxic and tumor promotion effects in lab animals as well as in humans.

CFS submits this further comment in **opposition** to the proposal, including the attached two studies, incorporated herein by reference. This comment focuses on the increased risk of coronary heart disease and other health problems due to the doubling of *trans* fat resulting from irradiation of ground beef.

**Study 1. Effects of irradiation on *trans* fatty acids formation in ground beef.** (Brito, M.S., A.L.C.H. Villavicencio, and J. Mancini-filho. 2002. Effects of irradiation on *trans* fatty acids formation in ground beef. *Radiation Physics and Chemistry* 63: 337-340.) This recent research tested the levels of various fats and fatty acids in irradiated ground beef. The key finding, summarized in Table 4 therein, is that irradiation at room temperature approximately doubled the prevalence of *trans* fatty acids, from 4.6 % in unirradiated samples to 8.5 % in samples irradiated at 4.5 kiloGrays, the maximum allowable dose for fresh ground beef under FDA regulations.

**Study 2. Dietary intake recommendations for *trans* fatty acids.** (National Academies of Sciences, Institute of Medicine, Panel on Macronutrients. 2002 Letter Report on Dietary Reference Intakes for *Trans* Fatty Acids (July 10), at p. 14: The excerpt attached includes only the pertinent pages on risks, pp. 5-14.) In this crucial report on *trans* fatty acids issued last year by the National

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Academies of Sciences, Institute of Medicine (IOM), the coronary heart disease (CHD) risks presented by these substances, which, again, are doubled in quantity when ground beef is irradiated, are as follows (emphasis added; citations omitted):

*Similar to saturated fatty acids, there is a positive linear trend between trans fatty acid intake and LDL cholesterol concentrations. Some evidence also suggests that trans fatty acids result in lower HDL cholesterol concentrations (Table 6). Hence, the net result is a higher total cholesterol (or LDL cholesterol):HDL cholesterol ratio. This finding, combined with data from prospective cohort studies (Table 6), has led to the concern that dietary trans fatty acids are more deleterious with respect to coronary heart disease than saturated fatty acids.*

*Summary - There is a positive linear trend between trans fatty acid intake and total and LDL cholesterol concentration, and therefore increased risk of CHD, thus **suggesting a Tolerable Upper Intake Level (UL) of zero**. Because trans fatty acids are unavoidable in ordinary diets, achieving such a UL would require extraordinary changes in patterns of dietary intake. Such extraordinary adjustments may introduce other undesirable effects (e.g., elimination of foods, such as dairy products and meats, that contain trans fatty acids may result in inadequate intakes of protein and certain micronutrients) and unknown and unquantifiable health risks may be introduced by any extreme adjustments in dietary pattern. For these reasons, no UL is proposed. **Nevertheless, it is recommended that trans fatty acid consumption be as low as possible while consuming a nutritionally adequate diet.***

As indicated the evidence suggests a Tolerable Upper Intake Level of **zero**. In any event, *trans* fatty acid consumption should be minimized. This IOM recommendation directly contrasts with the pending proposal, which would allow irradiation of ground beef fed to tens of millions of school children, thereby significantly increasing their *trans* fatty acid consumption. USDA must consider the cumulative macronutritional effect of American children eating such foods in a prospectively heavily irradiated diet.

The list of other documented non-cholesterol and non-CHD related health problems associated with *trans* fat is surely well-known to USDA. According to the Trans Fatty Acid Fact Sheet (on Trans Fat Info Web <http://www.enig.com/0001t1b.html>), maintained by a leading fat researcher, Mary G. Enig, Ph.D., F.A.C.N., Director, Nutritional Sciences Division, Enig Associates, Inc., Silver Spring, MD, this fat:

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- *lowers the amount of cream (volume) in milk from lactating females in all species studied, including humans, thus lowering the overall quality available to the infant;*
- *correlates to low birth weight in human infants;*
- *increases blood insulin levels in humans in response to glucose load, increasing risk for diabetes;*
- *affects immune response by lowering efficiency of B cell response and increasing proliferation of T cells;*
- *decreases levels of testosterone in male animals, increases level of abnormal sperm, and interferes with gestation in females;*
- *decreases the response of the red blood cell to insulin, thus having a potentially undesirable effect in diabetics;*
- *inhibits the function of membrane-related enzymes such as the delta-6 desaturase, resulting in decreased conversion of, e.g., linoleic acid to arachidonic acid;*
- *causes adverse alterations in the activities of the important enzyme system that metabolizes chemical carcinogens and drugs (medications), i.e., the mixed function oxidase cytochromes P-448/450;*
- *causes alterations in physiological properties of biological membranes including measurements of membrane transport and membrane fluidity;*
- *causes alterations in adipose cell size, cell number, lipid class, and fatty acid composition;*
- *adversely interacts with conversion of plant omega-3 fatty acids to elongated omega-3 tissue fatty acids;*
- *escalates adverse effects of essential fatty acid deficiency; and*
- *increases peroxisomal activity (potentiates free-radical formation).*

To summarize the apparent risks of eating irradiated ground beef that is, for example, grilled are considerable: – **First**, red meat consumption is a well-known risk factor for a myriad of health problems. **Second**, grilling coats the beef with polycyclic aromatic hydrocarbons, which are known carcinogens. **Third**, grilling meat creates heterocyclic amines, which are mutagens and carcinogens associated with both respiratory tract cancers (from the fumes) and colon cancer. **Fourth**, as we stated in our last comment, irradiated beef contains the unique radiolytic products, 2-alkylcyclobutanones, which are genotoxic in concentration and act as colon tumor promoters if consumed together with known colon carcinogens (as are present in this case). **Fifth**, the doubling of *trans* fat in irradiated compared to non-irradiated ground beef increases the risks of CHD. **Sixth**, the *trans* fat increase also increases risks of a variety of other health problems, listed above.

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These health risks should cause USDA to reconsider before it approves such a potentially tragic and scandalous proposal. With this array of associated risks it appears that irradiated ground beef should be declared unsafe and unwholesome for school children, not fed to them.

In conclusion, neither you nor American pupils or their parents can be reassured that irradiated ground beef is safe and wholesome in view of the combined evidence indicating health and nutrition impacts. USDA simply cannot ignore scientific reports showing doubled *trans* fat and other harms. Public hearings are needed to address the health and nutrition issues we have raised, which could affect tens of millions of school children, mostly unknowingly. At a minimum USDA needs to inform parents of the *trans* fat doubling and other harms, and obtained informed consent, before their children are fed the material.

Thank you for your consideration of this comment. Please contact me if you would like further information.

Sincerely,

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Attachments