

# IRRADIATION OF MEAT: THE FDA AND PUBLIC OPINION

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*This essay examines United States Food and Drug Administration (FDA) policy towards the irradiation of meat—the process of passing meat through radiation to kill potentially harmful bacteria. Taking a critical view, this paper argues that the FDA largely functioned outside of its mandate to be autonomous from public opinion with regard to the irradiation of meat. Rather, for approximately twenty years, the FDA did not implement this meat irradiation technology because it operated in accordance with a public opinion that was largely skeptical of irradiation technology.*

## INTRODUCTION

Skepticism regarding the safety of popular luncheon meats available in supermarkets exists in America's often comedic entertainment culture. As Jerry Seinfeld notes, "That Oscar Mayer section is creepy, this guy's inventing meat—there's no Olive Loaf animal as far as I know."<sup>1</sup> Seinfeld's observation demonstrates that many Americans may not understand the relationship between the historical evolution of food regulation, and the application of science to it. However, it is these two elements that work together to ensure that Oscar Mayer wieners are products of a safe food supply in America.

When applied to foods such as meat, vegetables, and fruits, ionizing radiation has the ability to kill bacteria that can be harmful to one's health upon ingestion or lead to food spoilage.<sup>2</sup> Applying this science beyond a lab to irradiate food available in supermarkets can be viewed as an interplay between various groups espousing or criticizing the implementation of irradiation technology on one hand, and the role of citizens galvanizing government to regulate the food supply on a national basis on the other. Secondly,

<sup>1</sup> Jerry Seinfeld, *I'm telling you for the Last Time*, Track 6.

<sup>2</sup> *Food Irradiation, A Technique for Preserving and Improving the Safety of Food*, Published by the World Health Organization et al., p. 18

how governmental organizations respond to this science and public sentiments regarding possible policy paths to regulate America's food is another issue. This historical narrative for irradiation technology begins with the end of World War II.

The post-war political context altered the trajectory of nuclear science, privileging implementation of technology to improve civilian life, rather than using such technology solely for military endeavors. Subsequent research by the military demonstrated irradiating food posed no harm to public health, illuminating the potential commercial applications for this technology, which substantial scientific evidence showed to be credible throughout the twentieth and into the twenty-first centuries. Yet, the framework to implement irradiation technology on a national commercial basis is based upon the early twentieth century's establishment of national regulations of food processing.

The regulatory area of the Bureau of Chemistry became the Food and Drug Administration (FDA) in 1931; providing the national agency to implement laws regarding food regulation. The creation of the FDA in 1931 dramatically altered America's food regulations. The FDA. Ideally, the FDA was to use science to determine regulatory policy rather than public opinion as the impetus for the first national food regulation. Public opinion, however, proved to be an obstacle in determining policy; as the American public exerted a tremendous influence regarding the implementation of irradiation since opponents believed that implementing such technology would lead to environmental damage. Therefore, the FDA severely delayed the use of irradiation, despite scientific evidence that it could benefit human life. Despite the omnipresence of sound scientific evidence that irradiation technology could improve the safety of America's food supply, this case shows how the FDA—for the majority of the mid and latter twentieth century—was primarily subservient to, rather than autonomous from, public opinion.

## IDEOLOGICAL OUTGROWTH

In the 1950s, Arch Booth, the executive vice president of the United States Chamber of Commerce, showed a video of a mushroom cloud to his colleagues, where he articulated the relationship between Americans and nuclear technology, "We have lived under the shadow of this cloud for the past eleven years... [a cloud that]... has filled the hearts

of men and women all over the world with fear.”<sup>3</sup> Within this apocalyptic vision, Booth revealed the popular American connotations of anything pertaining to nuclear energy—fear of war, and death. The popular association of irradiation of meat with an apocalyptic war proves to be the primary hurdle in implementing this technology on a national and commercial basis. Yet, within this post-World War II context, Booth, in conjunction with the Atomic Energy Commission (AEC), began to replace “the fear of the power of the atom... [with a]... very strong faith that the atom will become man’s greatest benefactor.”<sup>4</sup>

The impetus to implement a new trajectory regarding the application of nuclear technology arose from AEC officials feeling a “moral compulsion... to seek some redeeming value in new technology that threatened the future of civilization.”<sup>5</sup> According to the AEC during the 1950s, “the development and utilization of atomic energy shall be directed toward improving the public welfare, increasing the standard of living.”<sup>6</sup> Disease free food, for instance, is invariably tied to an increase in the American standard of living as a result an outgrowth of the nuclear era, applying science to the food supply.

The most groundbreaking research for the irradiation of meat began, not for a blanket commercial application, but rather “for a far more parochial purpose.”<sup>7</sup> The Department of Defense saw the utility of having spoil resistant, irradiated food on the battle field. Beginning in 1951, and continuing throughout the next 30 years, The Army Quartermaster Corps spent approximately 50 million dollars to determine the health risks posed by irradiated food as well as its commercial application.<sup>8</sup> The general political climate in the 1950s, therefore, was empathetic to applying science to benefit human life, a concept the media picked up on. As *Science Digest* predicted, “by 1960... foods [that have been irradiated] will be on the market... [and]... within

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3 Arch N. Booth, “For Human Betterment” in a speech during the 44<sup>th</sup> Annual Meeting of the Chamber of Commerce, April 30<sup>th</sup> to May 1<sup>st</sup>, 1956, series 1, box 25, Hangley Archives, Wilmington Delaware; originally found in James Spiller, “Radiant Cuisine, The Commercial Fate of Food Irradiation in the United States,” *Technology and Culture*, October 2004, vol. 45, p. 742

4 Ibid.

5 Richard G. Hewett. *Atoms for Peace and War, 1953-1961 Eisenhower and the atomic energy commission*. (Berkeley, University of California Press, 1989), p. 239

6 Ibid.

7 Army Scientific Advisory Panel, Ad Hoc Group for Irradiated Food Program, *The U.S. Army’s Radiation Preservation of Food Program* (Washington, D.C., 1972)

8 Ibid.

20 years, five to ten percent of the foods may be irradiated.”<sup>9</sup> The media played a crucial role in articulating how irradiation technology could benefit everyday American life. For example, *Time* magazine reported tests results of irradiating food; and *The Washington Post* published interviews with U.S. policymakers concerning the benefits of irradiated food. These media outlets thus played an important role in forming the American public’s varied opinion regarding irradiated food. Yet, the legal and institutional framework for implementing the science of irradiation, to produce a spoil-and disease-free food in particular, is found within the origins of food regulation in general.

## ORIGINS OF REGULATION

Early nineteenth century food regulation provided states with autonomy to choose regulations regarding the processing of and additives to foods. Such food-oriented federalism did not produce standardized regulations, which, some believed, threatened public health. In 1883, Harvey W. Wiley, the Chief Chemist for the United States Department of Agriculture Division of Chemistry, began investigating the health dangers posed by a nationally unregulated food supply. The catalyst for action, according to Wiley’s biographer, was Wiley’s belief that “as [food] processing shifted from home to factory, competition intensified, and manufactures, their ethical standards dulled by the impersonality of their function, debased their goods in the struggle to survive.”<sup>10</sup> Thus, industrialization and urbanization tended to produce unregulated use of additives which posed a health threat to Americans.

Therefore, in 1902, Wiley began a national advocacy campaign to create a national food regulation policy. Wiley, who had a “flair for publicity,” created the Poison Squad, a dozen volunteers who lived on six month long diets that included doses of food additives, such as boric acid, which if ingested in high amounts could produce adverse health effects.<sup>11</sup> The study’s findings did not reveal significant dangers of food additives. However, it significantly increased the saliency of federal food regulation within the popular American political consciousness. This produced calls for federal regulation because of the dangers posed by an unregulated meat industry.

Upton Sinclair’s *The Jungle* (1906) played a critical role in the step toward regulating the meat supply by revealing the pre-regulatory realities of the Chicago meat packing industry:

9 “Soon: Irradiation Foods!” *Science Digest*, December 1957, p.1

10 Peter Temin. *Taking Your Medicine, Drug Regulation in the United States*. (Cambridge: Harvard University Press, 1980), p. 27.

11 Ibid.

There was never the least attention paid to what was cut up for sausage; there would come all the way back from Europe old sausage that had been rejected, and that was mouldy [*sic*] and white—it would be dosed with borax and glycerin, and dumped into the hoppers and made over again for home consumption... and thousands of rats would race about it.<sup>12</sup>

Although Sinclair aimed for “the hearts” of Americans—hoping that his narrative would lead to condemnation of capitalism, spawning a socialist movement—his vivid account of moldy sausage, for instance, hit “the stomachs” of hungry, meat loving citizens. This produced two primary effects which are discussed below.<sup>13</sup>

*The Jungle* galvanized Americans and members of the media to demand national food regulation. After reading Sinclair’s text, citizens sent hundreds of letters per day to President Roosevelt, expressing concern regarding food regulation. Moreover, a section of the media, deemed “muckrakers” committed to exposing the social, economic, and political ills of industrial life during the twentieth century utilized Sinclair’s work to expose the ills of American meat packing to the public. The media, therefore, played a crucial role as it exposed why national regulations of the food supply should be created. Letters, popular media sources, and Wiley’s campaign influenced the 1905 State of the Union address.

Roosevelt stated, “I recommend that a law be enacted to regulate inter-State commerce in misbranded and adulterated foods, drinks, and drugs...to secure the health and welfare of the consuming public”.<sup>14</sup> The President, therefore, called for such legislation on this issue because it significantly resonated among his constituency; this uproar among his constituency, rather than the content of *The Jungle* was the primary catalyst for federal food regulation. However, significant opposition arose from trade associations, wholesale and retail grocers because of standards implemented to ensure the quality and safety of the American food supply. Yet, the strength of public outcry—demanding a safe food supply, required a federal response to regulate myriad food producers,

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12 Upton Sinclair, *The Jungle*. (Signet Classic: The New American Library, New York, New York, 1905-1906), p. 136.

13 Harvey James Young. “The Pig that fell into the privy: Upton Sinclair’s *The Jungle* and the Meat Inspection Amendments of 1906.” *Bulletin of the History of Medicine*, 59, (1985): 467-480.

14 InfoPlease. “Collected State of the Union Address of U.S. Presidents, Theodore Roosevelt, December 5, 1905.” March 2005 <<http://www.infoplease.com/t/hist/state-of-the-union/117.html>>

sellers, and handlers.<sup>15</sup> Moreover, food companies eventually supported the legislation because they too did not want to be seen as condemning regulations which degrade their public image by opposing the national food health. Therefore, in 1906, a confluence of individual, collective, and media efforts produced federal legislation, demonstrating that in the initial step of policy formation, individuals played a crucial role in implementing public policy to ensure food safety.

## REGULATORY FRAMEWORK

The 1906 Pure Food Act prevented “the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods.”<sup>16</sup> As an add-on, the Meat Inspection Act created cleanliness standards for slaughterhouse and processing plants, and inspection processes for cattle, sheep, horse, swine, and goats destined for human consumption.<sup>17</sup> However, the 1906 Food Acts focused on regulating “small, marginal suppliers of food;” a flaw which counteracts an effect of *The Jungle*—which exposed the disgusting aspects of large meat suppliers, rather than smaller ones.<sup>18</sup> Public opinion, which galvanized support for the passage of these laws, did not govern their implementation—and in doing so, the laws were only a first step in regulating the meat supply. Wiley became an advocate of “more stringent reform” of the national food regulation. In contrast, the creation of the FDA altered food regulation—as the agency’s own regulations, rather than public opinion, guided future food regulations.<sup>19</sup>

Science, as well as the need to have a safe food supply, became the two factors that largely determined the FDA’s policy regarding irradiation. However, public opinion regarding the irradiation of meat formed a significant part of the narrative of applying this science on a national commercial basis. Popular connotations of irradiation technology with war—rather than the science of the technology—restrained the FDA from implementing the technology when it first learned of the use of science.

However, 1931 provided a legal and intuitional foundation to

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15 William Parmenter. “The Jungle and Its Effects.” *Journalism History* 10:12 (Spring-Summer 1982), p. 14.

16 Peter Temin. *Taking Your Medicine, Drug Regulation in the United States*. (Cambridge: Harvard University Press, 1980), p. 27.

17 InfoPlease. “Collected State of the Union Address of U.S. Presidents, Theodore Roosevelt, December 5, 1905.” March 2005 <<http://www.infoplease.com/t/hist/state-of-the-union/117.html>>

18 Ibid.

19 Peter Temin, *Taking Your Medicine, Drug Regulation in the United States*, (Cambridge: Harvard University Press, 1980), p. 32.

regulate food on a national basis by providing the discovery, testing, and implementation framework to utilize the science of food irradiation. Further, the same aspects of obtaining basic national regulation—the use of individuals and media—parallel the history of irradiation. Negative connotations associated with atoms, FDA policies, and ignorance of science represent hurdles—and means—to oppose, or advocate, the use of irradiation.

## SOUND SCIENCE

In 1951, the Quartermaster Commanders began testing of irradiation technology. Irradiated food was first fed to animals and then to humans. The Quartermaster doctors concluded that consuming irradiated food had no adverse effects on people.<sup>20</sup> Yet, a number of foods developed odd colors, textures, and flavors. Scientists concluded that these marginal changes to the appearances of food did not alter their molecular structure in a way which would pose a threat to humans upon consumption.<sup>21</sup> In May 1956, army representatives believed that this technology could be applied to public food consumption, as consuming irradiated foods did not create adverse health affects and extended the shelf life of foods. The army therefore created the Interdepartmental Committee on Radiation Preservation of Foods; and in 1957, the army allocated \$7.5 million for a “pilot-to-production size” radiation facility in Stockton, California.<sup>22</sup> This facility attempted to apply the emerging science of meat-irradiation on a national and commercial basis. The confidence that nuclear technology could be applied to benefit the American food supply was clearly evident though the army’s testing. However, as the sound science of irradiation began to show commercial viability. An interplay between advocacy groups began which severely slowed the implementation of the technology; further, the regulatory framework for food regulation presented a huge hurdle to the implementation of irradiation.

## REGULATORY HURDLE

An obstacle to using sound science occurred in 1958, as an amendment to the 1938 Food, Drug, and Cosmetic Act. The 1938 act established labeling standards for food; the 1958 amendment; however,

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20 Army Scientific Advisory Panel, Ad Hoc Group for Irradiated Food Program, *The U.S. Army's Radiation Preservation of Food Program* (Washington, D.C., 1972), p. 6.

21 Ibid.

22 James Spiller. “Radiant Cuisine, The Commercial Fate of Food Irradiation in the United States.” *Technology and Culture* 45 (October 2004), p. 747

altered the testing procedure of additives to foods. The amendment combined radiation with chemical preservatives, providing the FDA with regulatory oversight to approve food for public consumption that had been treated with preservatives.<sup>23</sup> This development created a hurdle to irradiation because the new testing procedures required one hundred times the dose of a preservative to be placed in the item if it was to remain on the supermarket shelf. To ensure that the chemical was non-carcinogenic and nutritionally wholesome, the food had to be given to animals, supposedly provided during a two year study. This process invariably increased the amount of radiation in food to amounts that were extremely harmful to the test animal—and human health as well. This development made irradiating food, by law, unsafe for use in human consumption; as testing under this law caused test animals to suffer severe health problems. The media, which had played a vital role in advocating for irradiation, began to report on problems with testing. *Time* magazine, for example, reported that “rats died before their time... [that] mice developed enlarged arteries in their hearts.”<sup>24</sup> Thus, media outlets, which played a vital role in calling for food national food regulation and praised the commercial application of irradiation, dramatically altered their tone. This showed that the media, therefore, could be used both ways—to espouse the dangers and benefits of irradiation technology.

However, despite such test results, the army continued to plan to use irradiation technology. However, in 1963, the FDA approved the army’s petition to irradiate canned bacon for use within its ranks. Three years later, in concert with the AEC, the army built an irradiator which would process more than one million pounds of meat annually.<sup>25</sup> The application of the science was clear: irradiation did not harm humans, and it could eliminate harmful bacteria. The law, however, was not clear: as it created a situation in which irradiation could not become legal through the means outlined in the 1958 amendment, despite sound scientific evidence indicating that irradiated foods are safe for human consumption. The laws of regulation and the context and connotations of anything related to nuclear technology began a battle to implement this technology on a national basis.

## ADVOCACY INTERPLAY

In the 1970s, two movements presented challenges to the national application of irradiation technology. First off, connotations of nuclear technology progressed away from nuclear war, and instead,

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23 Ibid, p. 14.

24 “Man of the Year, Twenty Five and Under,” *Time*, 6 January 1967, 18.

25 James Spiller. “Radiant Cuisine, The Commercial Fate of Food Irradiation in the United States.” *Technology and Culture* 45 (October 2004), p. 9

became replaced with an emphasis on how such science threatens the environment. According to Michael Smith, author of “Advertising the Atom”, the near melt down of Three Mile Island was a turning point in “the nuclear power controversy, swinging the press over to the antinuclear power perspective and solidifying the de facto moratorium on new reactor orders”.<sup>26</sup> Therefore, groups condemning the effects of applying irradiation technology across the United States, worried that it would affect air and water quality, for instance, and began to challenge this science. The movement towards organic foods, in particular, represents an outgrowth of the concern for the environment during the 1970s.

Proponents of organic food production mark a group that opposed the implementation of irradiation technology. *Appetite For Change*, by Warren J. Belasco, argues that the growth of science to ensure a safe food supply was antithetical to environmentalists who reacted away from increasingly complex food production:

Before World War II food processing was relatively simple and mechanical: e.g., breaking down wheat kernels into still identifiable flour, germ, and chaff or vacuum sealing vegetables in tin cans. But after the war, food technologists began to go much further, breaking raw grains down to their as molecular structure and reassembling them into foods that bore no resemblance to the raw materials out of which they were fabricated.<sup>27</sup>

Thus, individuals opposed to the use of science and in favor of utilizing simple production methods, created new opposition to the attempted commercialization of food irradiation technology. Further, proponents of organic foods organized a campaign against using irradiation to ensure the safety of the food supply—an argument which focused on “labor-intensive farmers” as the means to protect the environment and produce health food, which “felt nostalgic for a simpler, cleaner life,” a sharp contrast to the complex science of irradiating foods.

However, supporters for meat irradiation reacted against this strong opposition. As part of this movement, *The Washington Post* quoted Margaret Heckler, Secretary of Health and Human Services, in support of irradiation and believed the technology “[would]

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<sup>26</sup> Michael Smith. “Advertising the Atom.” In *Government and Environmental Politics: Essays on Historical Developments Since World War Two*, ed. Michael Smith. (The Woodrow Wilson Center Press and the Johns Hopkins University Press, 1991), p. 257

<sup>27</sup> Warren J Belasco. “*Appetite for Change How the Counterculture took on the Food Industry, 1966-1988.*” (Ithaca, New York: Cornell University Press, 1989) p. 37

reduce our dependence on treatment of food...with chemicals...and could diminish the dangers of chemical application for the country's agricultural workers."<sup>28</sup> The interplay of issues caused the FDA to admit that food irradiation was "one of the most attention-getting proposals in the FDA's history."<sup>29</sup> The public discourse pertaining to irradiation technology limited the FDA by applying this technology on a solely commercial basis. In doing so, the agency counteracted its premise to be autonomous from advocacy campaigns—to focus on science which can ensure a safe food supply. For the majority of the twentieth century, the FDA was subservient to, rather than autonomous from, public opinion. However, the primacy of science eventually allowed irradiation technology to transcend regulatory obstacles.

## OVERCOMING HURDLES

Two factors can be attributed to overcoming the obstacles of meat irradiation in regulating public opinion. Established by the FDA in 1979, the Bureau of Foods Irradiated Food Committee (BFIFC) reviewed, "the Agency's practices for evaluation of the safety of irradiated foods and...[recommended]...criteria for safety evaluation according to then-current state-of-the-art knowledge in toxicology, nutrition, and radiation chemistry."<sup>30</sup> This movement was part of a long process within the FDA to evaluate the use of irradiated food for use in the American food supply. This process, of evaluating science in terms of irradiation of meat, demonstrates the progression of food policies in America. Rather than public opinion, which determined the initial national food regulation policies, the FDA considered the science, rather than divergent public opinion, with regards to the irradiation of meat. The decision to implement science, however, did have public detractors, as seen throughout the environmental movement, for instance. The application of the technology to the free market also did not ensure acceptance, as connotations of irradiation persist.

The influence of public opinion on policy making becomes apparent despite clear and safe applications of science. The Coalition for Food Irradiation argued that in "over thirty years during which food irradiation has been studied, conclusive research has determined

28 Peterson, Class, "FDA Proposes Radiation Use as Fruit, Vegetable Pesticide." *Washington Post*, February, 15 1984.

29 Richard Thompson, "Speaking Up about FDA Regulations," *FDA Consumer* (July/August 1985): 24-26, quoted from James Spiller.

"Radiant Cuisine, The Commercial Fate of Food Irradiation in the United States." *Technology and Culture* 45 (October 2004), p. 755

30 James Spiller. "Radiant Cuisine, The Commercial Fate of Food Irradiation in the United States". *Technology and Culture* 45 (October 2004), p 754

[radiation] does not make harmful new substances in food... and does not significantly affect the nutritional quality of foods."<sup>31</sup> In 1985 the FDA legalized the commercial application of irradiation technology in meat. Furthermore, in 1986, the FDA expanded the application of irradiation technology to apply to vegetables and spices.<sup>32</sup> Such implementation of technology may appear to pave the road for broad commercial success of irradiated foods; however, consumer connotations still prevent the commercial success of food irradiation; as many associate an outgrowth of nuclear energy with war, pollution, and a waste of government power. In the end, the same methods proponents and opponents utilized for their respective causes could not transcend science which had clear utility to everyday life.

In 1997, the FDA established regulations to permit ionized radiation as a source of radiation to treat refrigerated or frozen uncooked meat, meat byproducts, and certain food products to control food-borne pathogens and to extend shelf life. Further, in 2000 USDA's regulations were amended to allow the irradiation of refrigerated and frozen and uncooked meat, meat byproducts, and certain other meat food products to reduce the levels of food borne pathogens and to extend shelf life.<sup>33</sup> A 1998-1999 survey conducted by FootNet found that approximately half of the adults surveyed were willing to purchase irradiated foods; while 31.8 percent of respondents indicated that they would not purchase irradiated foods, 18.5 percent of respondents were not sure if they would purchase irradiated foods given the chance to do so.<sup>34</sup> Irradiated food, however, will raise the cost of beef by two cents per pound.<sup>35</sup> Only 23 respondents in the same survey indicated that they were willing to pay more for irradiated ground beef; only 25 percent were willing to pay more for irradiated chicken.<sup>36</sup> The FoodNet survey suggests that the majority of consumers would not purchase irradiated products because of increased costs associated with this process.<sup>37</sup>

In a similar study, 35 percent of respondents stated reluctance to purchase irradiated meat because of insufficient information about

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31 Ibid, p. 17

32 United States General Accounting Office "Food Irradiation, Available Research Indicates that Benefits Outweigh Risk." March 2005 <<http://www.gao.gov/new.items/rc00217.pdf>>, p. 27

33 Ibid

34 Frenzen, Paul D., Majchrowicz, Alex, et al. United States Department of Agriculture, Economic Research Service. "Issues in Food Safety Economics, Consumer Acceptance of Irradiated Meat and Poultry Products," August 2000 <<http://www.ers.usda.gov/publications/aib757/aib757.pdf>>

35 Ibid.

36 Ibid.

37 Ibid.

its benefits.<sup>38</sup> Further, approximately 22 percent of respondents cited concern in the safety of irradiated meat as the reason they would not purchase the product. Further, 3.9 percent of respondents cited concern that irradiation could harm the environment as a reason not to purchase irradiated meat.<sup>39</sup> Many American consumers have some level of understanding about irradiated meat, yet lack basic scientific facts to make an informed decision about the irradiation process. Education programs could alleviate the consumer concerns about irradiation and increase demand for the food.<sup>40</sup>

## CONCLUSION

Why is analyzing this particular policy important? The most basic answer appropriate for this question is that irradiation of meat policy provides an example of how public opinion governs public policy. In a modern political context, where Americans view the political realm separate from their lives, looking at how individuals—whether alone or in groups—can shape policy is extremely important. With the case considered in this paper, it is clear that the FDA does not always rely upon science to base its policies. The FDA should be more autonomous from public opinion regarding its policies toward such technologies as the irradiation of meat. In addition, the long-standing scientific evidence in support of the positive aspects of irradiated food, should form the basis of FDA policy. The strong influence of public opinion in the FDA's policies, with respect to whether or not it should implement irradiation technology, demonstrates the long, dark, and influential shadow subjective opinions can cast over objective science in American public policy.

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38 Ibid.

39 Ibid.

40 Ibid.

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