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Abstract

The responsibility for cutting a path through the tangled wood of information and misinformation to lead excited consumers, pork producers, legislators and even some scientists to the facts of the nitrite issue lies squarely on the shoulders of editors - in both print and electronic media.

The Agricultural College Editor and the Nitrite Scare: Reporting Utter Chaos

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The responsibility for cutting a path through the tangled wood of information and misinformation to lead excited consumers, pork producers, legislators and even some scientists to the facts of the nitrite issue lies squarely on the shoulders of editors—in both print and electronic media.

This is particularly true for the agricultural college writers and other scientific reporters who, by benefit of having more training and background in science and related subjects, should be better prepared to report such an issue than daily newspaper reporters. Another inherent advantage given the scientific writer is that of working intimately with the scientist and following the progress of his research. The issue of continuing to use nitrites in food is a specific case in which information has been confusing. This study will explore the nitrite controversy with an eye toward preventing confusion in future reporting of the topic.

Nitrates, as saltpeter, have been used for over 200 years to flavor and preserve meat. For all those years, human stomach bacteria have converted those nitrates into nitrites that are feared today(1). In 1925 scientists found sodium nitrite had a very important side effect; it completely inhibited the growth of *Colostridium Botulinum*, the bacteria that creates

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a deadly botulism toxin under certain conditions. So nitrites were considered a benefit to man. But recently, nitrites have been associated with cancer, although there is no conclusive evidence of this at present(2). However, enough doubt was cast, to cause the USDA to declare a one-year moratorium on the use of nitrites to allow scientists to examine the results of a controversial study conducted by Dr. Paul Newberne of the Massachusetts Institute of Technology. Had Newberne's data been affirmed, nitrite would have been removed as a food additive by April 30, 1982(3).

In the early 1950s, fear of harmful compounds being added to food precipitated a series of events destined to curb the use of nitrite. The 81st Congress of the United States created a Select Committee to investigate the Use of Chemicals in Foods and Cosmetics. This committee became known as the Delaney Committee, named for its chairman, New York Democrat James J. Delaney, now retired. For six years the Delaney committee and the Committee on Interstate and Foreign Commerce of the House of Representatives held "extensive and intensive" hearings concerning several types of food additives(4). The combined efforts of the committees resulted in the Food Additives Amendment of 1958, which amended the 1939 Food, Drug and Cosmetic Act. It was the wording of the Delaney clause that eventually precipitated the debate as to whether or not nitrite would be banned from American foodstuffs: "*Provided*, That no additive shall be deemed to be safe if it is found to induce cancer when ingested by man or animal, or if it is found, after tests which are appropriate for the evaluation of the safety of food additives, to induce cancer in man or animal...(5)".

The Delaney clause is a major obstacle to the continued use of nitrites today because, in effect, it puts carcinogens in a different category from that of other toxic substances. Most pesticides and herbicides that have residual effects in laboratory animals—but are not carcinogens—are not totally removed from the marketplace, but rather, are controlled in their use. One example is mercury, which is retained by the liver when ingested in chemical combination from sprays or pollutants. Persons eating liver from a cow that has grazed mercury-contaminated forage are in turn poisoned by the metal, which takes some time to build to toxic levels. The point is, rather than completely banning mercury, the USDA severely restricts its commercial uses.

Part of the confusion in reporting the nitrite issue today arises from this "zero tolerance" stipulation in the Delaney

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clause. For instance, John W. Hanley, Chairman of the Monsanto Company, a large producer of sodium nitrite, insists that, "In today's society, you can't live with zero risk.... We know more about man's ability to cope with small quantities of chemicals now than we did five years ago. We must determine which ones we can cope with and how to deal with them." But a differing opinion is expressed by Dr. Sidney M. Wolfe, director of Public Citizen, a private health research group: "When you go from high doses to low doses, you don't remove the risk of cancer; you just lessen it. And when we're talking about two hundred million people being exposed, even a small risk is a large number of cases(6)."

Thus the element of confusion is spawned: One side with a vested interest, employing scientifically-trained personnel tells only its view of the story, while the other with its vested interest spreads an opposing view. Both leave out the details needed to clarify the total picture. Hanley fails to mention possible nitrite substitutes currently under study, such as sodium sorbate used with low levels of nitrite; or different processing methods, such as freezing or cooking meats prior to shipping to allow the use of the product without fear of botulism poisoning. Wolfe seems to ignore the possibility of large outbreaks of botulism cases that could result from not having an adequate substitute for nitrite. To give consumers an accurate and total picture, editors should employ both men as sources, then check their statements with a scientist for accuracy.

With the Delaney clause for ammunition, consumer groups immediately attacked Red Dye No. 2 (a popular food coloring used to improve the appearance of cranberries and cherries) and succeeded in getting it banned. This issue was a precursor for the nitrite issue, because it served to alert the public to the fact that questionable materials were being added to food. Next the consumer groups turned their attentions to diethylstilbesterol (DES), a synthetic female sex hormone used to promote growth in fowl and cattle. According to Oklahoma State University poultry scientist Rollin Thayer, the discovery of carcinogenic effects from feeding DES to poultry was accidental. The heads and entrails of chickens were used as feed for commercially raised mink. When some of the animals died of cancer, a study was conducted and revealed the source(7).

A third major undertaking spurred by consumer concerns was the saccharin ban that was imposed on the public. It was only turned around when immense public outcry, combined

with data presented by American scientists refuting the negative findings of the Canadian scientists, swayed the opinions of lawmakers. But saccharin-containing foodstuffs still must bear a warning label.

By examining the other bans—that of Red Dye No. 2, DES and saccharin—a pattern can be seen developing that reflects a need for accurate information. It almost seems as if these respective cases were designed to challenge the compounds in an ascending order of importance, with the most-needed compounds last. Nitrites are simply more important than the previously contested products—Red Dye No. 2 was very important to the food coloring industry for instance, and although some powerful firms were represented, the issue did not deal with large numbers of people who really cared about keeping this particular product on the market. The general apathy was aided by the fact that several substitute products would provide the desired colors without the threat of cancer. DES involved large numbers of cattle producers across the country who have their own association complete with lobbyists to fight their battles on Capitol Hill. The poultry industry was not so well represented. So when the research data went against using DES, they quickly submitted to the ban. Saccharin was a different issue altogether. It involved millions of people as well as major industries who wished to continue using the product although it was a proven carcinogenic in certain laboratory animals.

Then came the nitrite issue, which affects everyone in the country. Nitrites are in many of the foods we eat, in our water and even occur naturally in our saliva:

> *Since we eat plants, we must of necessity eat the nitrate and nitrite they naturally contain along with their protein. How much of these are we talking about? Most fresh vegetables contain about a half part per million nitrite, with some as high as six parts per million. They also contain much larger amounts of nitrate, which is converted easily to nitrite. This is a fortunate biological trick for humans who love to eat leafy vegetables, because without the complete conversion of nitrates to nitrites, nitrate toxicity would make the plants poisonous. Celery has 1,600-2,600 parts nitrate per million, lettuce 100-1400, radishes 2,400-3,000, potatoes 120, zucchini squash 600 and so on(8).*

But the nitrite in question is that used to cure meat and meat products, and millions of people would have been affected by its ban. Major industries are again affected by the proposed legislation, which means legislators are caught between voters and lobbyists once again.

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The nitrite issue holds one point far more important to the average person than the other three issues dealt with: the threat of rapid death from botulism should the controversial compound be completely removed from various foodstuffs—without substitutes. This is of particular concern with bacon and canned meats. It is the combined fear of cancer and botulism that causes story sources on both sides of the nitrite issue to become adamant about their views of the subject. Because of this, normally dependable sources may become subconsciously or consciously biased. That requires a reporter to check carefully for accuracy. The responsibility for any writer or editor dealing with a nitrite story is, or should be, the concern for accuracy. All controversial stories should be checked with sources other than the scientist being publicized. Even though completely opposing views may be discovered, they give the writer another concept against which to view his article. For example, Lee Jorgensen, associate extension editor for Kansas State University, wrote a fine article about scientists at his university trying to come up with a suitable substitute for nitrite. In the article, he quotes KSU meat scientist D.H. Kropf as saying: ''lower nitrite levels involve less carcinogenic risk, both directly from nitrite and from formed nitrosamines (proven carcinogens that result from overcooking meat) (9).''

Enters the element of confusion. There are innumerable scientists who agree with this statement by Dr. Kropf, but there are also several who will testify that nitrites in small daily doses produce tumors more readily than do massive single doses. Jorgensen did a good job of reporting the facts given him by his source, but when dealing with an entangled issue such as this one, more than one source is definitely warranted.

Nitrites were considered quite useful and harmless when the Delaney clause went into effect in 1958. But technology was not as sophisticated at that time, as is pointed out by Herb Karner, agricultural editor for the **Tulsa World**. ''The Delaney clause was implemented in 1958, when scientists only had the capacity to detect compounds down to one part or more per million. Since then, scientists have advanced biochemical research techniques to the point that they can detect one part of a compound per trillion(10).'' A good analogy for one part in a million would be like looking for a kernel of corn in 714 bushels of wheat. By contrast, looking for one part in a trillion could be equated to seeking one specific drop in a lake.

It is this newly acquired technology that has many scientists and industry representatives regarding the Delaney clause as being outdated. Nitrosamines that could not be detected at the one part per million level in 1958 are now easily found with mass spectrometry methods that can measure in nanograms (one-billionth of a gram). This is the equipment by which reports of nitrosamines in a product must be confirmed today, particularly for regulartory purposes. And adjustments for the sensitivity levels would be unlikely to last long. The Thermal Energy Analyzer, a recently introduced instrument that can measure on picogram (one-trillionth of a gram) levels, is already creating problems in establishing regulatory guidelines(11).''

The ability to detect small amounts of nitrosamines first caused Food and Drug Administration officials to suspect nitrites. In a study of its own, FDA results seemed to indicate that more nitrite-cancer research was warranted. The FDA commissioned Newberne to investigate the nitrosamine-nitrite-cancer relationship in 1975. The resulting data became known as ''the MIT report,'' the very heart of the nitrite ban controversy. Yet very few articles have illustrated the highlights of that study or analyzed the room for argument that each entails.

Newberne used 1,380 rats in his study, one of the largest ever conducted. While the idea was to gain better statistical inferences from a given population by using many rats, critics of the MIT report now say that it is impossible to care for so many rats and to keep adequate data for providing accurate results. In FDA's earlier study, the data dealt only with lymphatic cancer. Because of this, Newberne centered his efforts on the same type of cancer, ignoring others. Again critics have denounced his effort, saying that this particular type of cancer is hard to initiate in test animals.

A real windfall for opponents of the MIT study was Newberne's decision to use urethane, a highly carcinogenic material, to initiate cancer in his laboratory rats. Although he stated that this chemical was stored in a locker room adjacent to the diet kitchen in his initial summation of the study, nitrite supporters now claim that the urethane was kept in the same room as the test rats. Newberne quieted most of the usual statistic-waving opponents who cite huge doses of a substance being fed to rats, by using a variety of feeding trials in the study. The trials varied from 200, 250, 500, 1,000 or 2,000 mg of sodium nitrite per kg of dry diet.

Using 104- and 117-week life spans for his rats, he gath-

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ered evidence of a decreasing survival rate with increasing concentrations of nitrite. Again he was criticized by some opponents—for keeping rats in a study too long, in which time they can develop cancer from any number of causes. Newberne found 12.5 percent incidence of lymphatic cancer in his rat population, compared with an 8.4 percent incidence in his non-treated control group. Also in examining the animals, he noticed "a cellular proliferation in the spleen" and lymph nodes of some of the animals in all the groups. When he compared his control group with those fed nitrite, he found a seven percent incidence versus 11.2 percent. Critics have taken advantage of the fact that Newberne found "cell proliferation" in all the groups. They claimed that this proliferation is evidence that some other factor was causing cancer in the MIT trials, either in addition to or aside from the nitrites being administered. This was probably one of the strongest points warranting the second look at Newberne's study. Newberne said there is no convincing evidence that these cells were a step in the tumorigenesis process in nitrite-treated animals, but noted that the presence of the cells did make the condition suspect(12). His critics have used the double sets of figures to great advantage, usually printing them as concrete findings that are to be doubted, with no explanation of their true meaning.

Almost all of the current controversy surrounding the nitrite issue deals directly with points of this study or relates to associated areas surrounding the study. It is easy to understand why reporting of the issue has varied, even in articles written by the same persons. Newberne's work immediately came under attack by opponents of any form of nitrite control, such as the **National Hog Farmer**, a publication that bases its existence on the pork production business. While the publication did a fair job of revealing each of the major points of Newberne's study, it attacked each with zeal. The editors published the findings of a three-scientist study conducted at Iowa State University in parenthesis and italics after each major point of the MIT work: "The observed pattern of tumors appears to rule out the possibility that the carcinogenic effect of nitrite occurred by the formation of nitrosamines in the diet of animals (MIT's report). (**This conclusion was disputed by a panel of Iowa State University scientists—see 'Iowa State Analysis of Nitrite Study, National Hog Farmer,' Oct. 15, 1978, page 9—editor**)(13). This kind of editorializing is not conducive to promoting open-mindedness concerning an important issue.

A subject with as many facets as the nitrite issue soon tries the patience and skill of all reporters involved with its coverage, from scientific information officers to newspapermen. The **Tulsa World**'s Herb Karner, who speaks with an authority earned by more than 20 years of reporting agricultural news, attributes much of the confusion and inaccuracies to the lack of professionalism on the part of many writers who do not understand the nitrite issue and/or do not understand the workings of either science or agriculture.

The result is conflicting reports of the same developments, explanations of only favored points of view and differing results offered from the same set of data accumulated by a given scientist. An example of this can be taken from treatment of the figures Newberne gives in reference to combining lymphoma and immunoblastic findings: The combined lesions are 15.3 percent in controls and 23.7 percent in treated animals. But several UPI and AP wire articles in both the **New York Times** and the **Tulsa World** refer to these figures as the only figures Newberne reports. **Successful Farming**, an Iowa-based publication, also reports the same figures(14), despite the fact that the editors are highly respected agricultural journalists. Making the differentiation between the lymphoma percentages alone and the combined percentages (12.5% vs. 8.4%—lymphoma and 23.7% vs. 15.3%—combined) would have actually been helpful to the publication's pro-nitrite stand.

The chaos in reporting the nitrite issue has resulted in making editors, even experienced ones such as Karner, leery of sources. Herein lies one of the major answers to the problem: **Document all sources as far as is possible in the amount of time available, particularly articles received as wire copy.** Continued good work on the part of some wire editors is soon noticed and their credibility increases, Karner said.

> *There are others who are deliberately distorting and sensationalizing the issue. I find myself generally ignoring much of the 'new facts' and wire reports on the issue, simply because I don't want to add confusion and help spread ignorance. But the problem is that there are always a few wire editors who simply tear a story off and use it without proper editing. We occasionally catch a story that is about to be used in this manner and is simply not correct. But the wire editor has assumed that because it was sent on the wire, it must be truth; likewise, the reader assumes it is truth because it is in the newspaper. There simply aren't enough qualified editors available to keep the confusion out of an issue like this* **carrier(15).**

In comparing the midwestern coverage of the nitrite issue by the **Tulsa World** with the eastern approach taken by the **New York Times**, it is obvious that Karner remained true to his stated opinions. Very few wire stories covering the nitrite issue ran in the **Tulsa World** and of those noted, most were short, no more than eight column inches, and usually were located over half-way into the newspaper. However, Karner does deal with the issue on his allotted farm pages, usually in a column entitled, "Fence Talk," published each Monday. Karner attempts an educational approach to the issue, but he openly admits to being pro-nitrite and this stand is frequently reflected in his writings. In his January 3, 1977, editorial, he explained the process of saltpeter being converted by bacteria in the stomach to nitrites. In researching the reporting, I found that Karner also has the first of very few articles that explained this point, along with the fact that saltpeter has been used for over 200 years for this purpose.

The **New York Times** used several staff written feature articles, usually within the first few pages of a family living section and most were prominently displayed with headlines and photographs. Wire stories also were used, although they were usually found farther back in the newspaper, but not buried so deeply as in the **Tulsa World**. The Times does an excellent job of remaining objective on the issue and takes a strong educational orientation to reporting it. One example is an article on the first page of a family living section. It is boxed and capped by a strong headline. Quotes by scientists on both sides of the issue help make the point that the arguments are confusing and that readers should use judgment in believing much of what is being written. This article is particularly on guard against bias and is reported in a highly professional manner(16).

But a **Times** article that appeared on January 27, 1978, is indicative of the need for agriculturally trained editors on a staff. Here is a professionally written feature article about a young, female Polish artist who took over her grandfather's butcher shop. Although the writer uses accurate quotes and lets her source "tell her own story," the public is still misled in the worst way—a believable way(17). What makes it believable? This young woman happens to be trying to learn the ropes of the butcher shop business while following the lead of her own conscience. So she makes top-notch human interest reading material. **But the facts are misconstrued by leaving out explanation.** For example, the story says, "The

intolerable part was a growing feeling that 'I was feeding people poison,' Miss Tostanoski recalled. She was selling sausages and frankfurters full of nitrites and other suspect additives, products she herself would not think of consuming.''

Persons in touch with the nitrite situation know that no conclusive evidence at this time indicates the additive is either carcinogenic or poisoncus in the amounts used to preserve meat. A couple of short paragraphs outlining the state of the nitrite issue would have made readers aware that the girl believed in what she was saying, yet educated them to the issue's current status. Another bias is made, inadvertently on the writer's part, when the girl is paraphrased as saying she has never consumed large quantities of meat, because she feels better when she doesn't. This intimates to many naive readers that professional opinions of dieticians throughout the world may be in error. Unfortunately, many readers readily believe this type of report, because it originates from someone who is, ''like themselves.'' These are the types of stories that are hardest for information officers to counteract, particularly if the featured person, whether in print or on radio or television, happens to be a celebrity.

Alert editors at **The Farmer**, a Minnesota-based agricultural publication, set a fine example for others to follow when they read an August 12, 1978, Associate Press wire story. Released the day after the MIT report was made public, this story reports, ''The Environmental Defense Fund, a consumer group which has long fought the use of nitrites, called for immediate banning of the preservatives.'' Doubtful that this meaning was intended, **The Farmer** editors contacted Anita Johnson, staff attorney for the group, who explained the correct attitude: ''I meant that the decision should be made right away,'' Johnson explained. ''I don't want to see FDA and USDA stalling for months and years without making the decision.... I don't think environmentalists are saying the nitrites should be off the market tomorrow. FDA should announce a timetable for taking nitrites off the market, and the timetable should be announced now(18).'' There are real advantages in Alice Johnson's request, particularly in the business of reporting future developments concerning nitrites with less confusion than occurred in the past.

Informative and readable information—this should be the goal of every writer; but it should especially be the goal of the science writer, because of the inherent difficulty in

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translating a researcher's analytical data into lay terms. Stories should go out to wire editors with the "So what?" waving from the first two paragraphs. Human interest should be even more at the forefront in reporting complicated issues, because the reader needs to know why he should read on. As the educational levels of society increase, so do the responsibilities of scientific reporters, because they are the professional communicators working closest with the often mysterious scientist. And people **are** interested in what scientists may have worth reporting. Hillier Krieghbaum of the Department of Journalism at New York University said, "The public reads science news and wants more. A survey for the National Association of Science Writers and New York University, financed by the Rockefeller Foundation, dramatically demonstrated this recently(19)." Krieghbaum notes that of 1,919 adults surveyed, 37 percent indicated they read all newspaper items dealing with medical news and 28 percent said they read all of the newspaper items dealing with nonmedical science stories. While Krieghbaum's survey is nearly 20 years old, it is not necessarily outdated. The interest may simply have shifted somewhat from print media to electronic. But both radio and television require written copy and science writers are fast learning to bring the accomplishments of the scientist to the ears and eyes of the public.

Scientists are learning that the public listens for what they have to say and they are also learning that what they have to say can be best expressed by speaking through experienced professionals. Dr. Frank Fremond-Smith, of the Josiah Macy Jr. Foundation, expressed his views:

> *It seems to me that the medical profession, the universities and hospitals have ignored too long the fact that they can be successful only with genuine public support only if their story, their very dramatic and thrilling story, is appropriately told to the public. There is no better group to tell this to the public in terms that the public can understand—because God knows, we cannot make ourselves understood to the public—than intelligent, thoughtful science writers(19).*

EDITOR'S NOTE: Causley wrote this article during the nitrite controversy. Newberne's later data defused much of it. So Causley's article is presented as a case study of how public confusion can be generated in science writing.

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