Cured Meats and Nitrite: The State of Science

A Resource for Professionals

NORTH AMERICAN MEAT INSTITUTE

Whether it's artisan charcuterie, sizzling bacon, satisfying beef jerky or classic hot dogs and bologna, consumers love cured meat products for their great taste and protein. But your clients may be wondering about the use of nitrate and nitrite to make these products. Why is it used? Why is it needed? Is it safe to consume foods containing nitrite? Which foods contain the most nitrite? Why are some products labeled "no-nitrite added?" These questions can be challenging for health professionals to answer, but a quick look at the facts reveals that meat products cured with nitrite can be part of your clients' normal, healthy, balanced diet.

Nitrite plays critical role in Food Safety

Meat curing was discovered by accident centuries ago when salt peter, a mineral containing nitrate, was added to meat and turned the meat pink while also preventing spoilage. This "accident" of food science soon became essential and widely embraced as sausage makers came realize that nitrite used for meat curing could control many dangerous bacteria from growing and extend shelf life. Today, these delicious meat products are part of food cultures around the world and likely enjoyed by your own clients. Bacon, corned beef, pastrami and beef salami in the U.S., Italian hams, and cured Mexican chorizo are just a few of the favorite products around the world that are made possible through curing.

Sodium nitrate and nitrite get a lot of the credit for creating cured meat's distinct flavor profiles and prevent them from spoiling quickly. Nitrite also prevents many harmful bacteria from growing and causing human illnesses. Since nitrite has been used commercially for cured products beginning in the mid-20th century, no human illnesses of botulism, have been associated with these products.

Take Home Messages for Clients

1. **More than 93 percent of human nitrite intake comes from fruits, vegetables and human saliva. Our body stores nitrite for later use in meeting our body's physiological demands for nitric oxide[1].**
2. **Whether added directly to cured meats as sodium nitrite or as a natural source using celery powder, nitrite allows the characteristics of cured meats to exist color, flavor and food safety.**
3. **The government inspects all meat products and regulates the use of nitrite to ensure it is used at the proper levels that have been scientifically shown to control harmful bacteria. Nitrite has been studied carefully by the National Institutes of Health and other government researchers and deemed safe at the levels used.**
4. **Cured meats pair well with vegetables and can add protein and flavor, which can encourage consumption of salads and green vegetables like spinach, green beans, asparagus and Brussel sprouts.**
5. **Nutrition and ingredient information is available on every package of prepared meat products. Products that carry certain nutrition claims like reduced sodium and low-fat can be found by visiting the Product Search Center of MeatPoultryNutrition.org.**
6. **A balanced diet that draws on a variety of foods is key and cured meats that contain nitrite can be part of that healthy mix along with fruits and vegetables that are also rich sources of nitrite.**

Most nitrite comes from vegetables and human saliva

Interestingly, most of the nitrite humans ingest actually doesn't come from cured meats. Approximately, ninety-three percent of human nitrite intake comes from vegetables and human saliva[2]. Root vegetables like beets and radishes, celery, as well as leafy greens like spinach and kale are rich sources of nitrate, and bacteria in the mouth convert a large portion of nitrate in vegetables to nitrite. Many people are surprised to learn that cured meats contribute less than five percent of consumers' typical daily nitrite intake[3].

Decades of research establish safety

Nitrate and nitrite became controversial because of studies in the 1960s and 1970s suggesting a potential cancer concern. The National Academies of Science reviewed the safety of cured meat in the early 1980s and concluded that cured meats were not a public health risk. Additionally, the National Toxicology Program launched two-year animal feeding study to assess nitrite safety. In 2000, a panel of scientists reviewed the results and concluded that nitrite did not cause cancer[4]. As a result, nitrite is not listed on the NTP's list of carcinogens. The scientific panel convened by the State of California also voted against listing nitrite as a carcinogen under its Proposition 65 law.

Creating products for every taste preference and nutrition need

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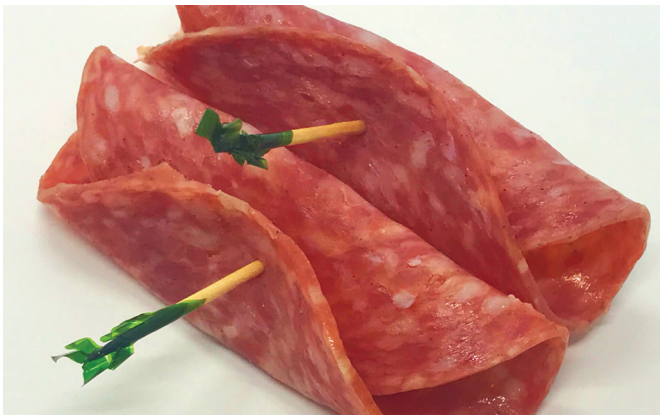


Prepared Meats can fit in with healthy eating

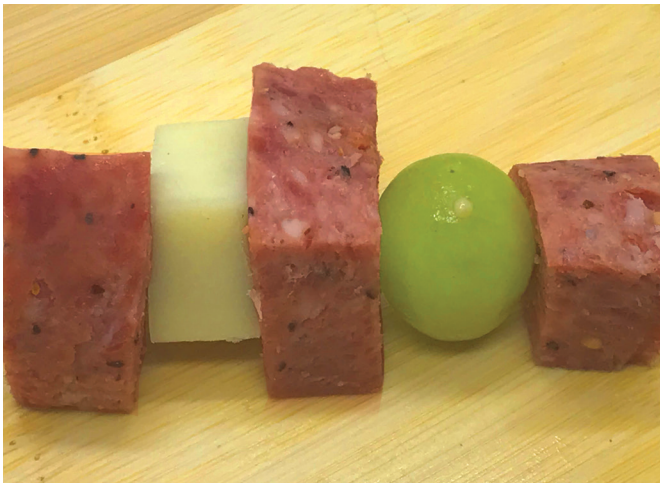
Like many aspects of health, the focus should be on eating a variety of foods to shape healthy eating patterns rather than trying to seek out or avoid one single ingredient or food. According to the Dietary Guidelines, "lean meats contribute important nutrients to the diet" –nutrients that might be hard to get from other protein sources. Healthy eating patterns can include a variety of different lean meats, including cured meats.

Research suggesting an association between cured meats and cancer have all been observational and cannot definitively prove cause and effect[5]. Cancer is a complex disease and many factors play a role including genetics and behavioral factors. No food or food category has been proven to cause or prevent cancer.

New research demonstrates nitrite's health benefits

The human body converts nitrate and nitrite to nitric oxide. Named the molecule of the year in 1992 by *Science Magazine*, nitric oxide is an essential molecule for physiological health and balance. In fact, the scientists who discovered the importance of nitric oxide were awarded the 1998 Nobel Prize in physiology. Nitric oxide helps wounds heal, prevents preeclampsia during pregnancy, helps regulate blood pressure and promote successful organ transplantation.

The National Institutes of Health in the last decade has come to recognize nitrite's safety and value and uses nitrite as a therapeutic treatment for many cardiovascular conditions. There have been more than 400 clinical research studies to evaluate the therapeutic applications of nitrate or nitrite[6].



'No nitrite added' products contain natural sources of nitrite

Because some consumers prefer only natural ingredients, many meat companies offer products that follow an alternative curing method using natural sources of nitrate and nitrite. Nitrate-rich celery powder is used to replace "purified nitrite," commonly known as sodium nitrite, to give cured products the same taste, color and safety profile consumers expect from traditionally cured products. Whether consumers choose products cured with nitrite or nitrate-rich celery power, these products are labeled wholesome and are inspected by the U.S. Department of Agriculture[7].

To search for products cured with natural curing ingredients along with a products bearing an array of claims that may meet your clients' needs or preferences, visit the Product Search Center at www.MeatPoultryNutrition.org.

[1] Clements, William, et al. "Nitrate Ingestion: A Review of the Health and Physical Performance Effects." MDPI, Multidisciplinary Digital Publishing Institute, 18 Nov. 2014, www.mdpi.com/2072-6643/6/11/5224/htm.

[2] Hord, N. G, et al. "Food sources of nitrates and nitrites: the physiologic context for potential health benefits." *American Journal of Clinical Nutrition*, vol. 90, no. 1, 2009, pp. 1–10., doi:10.3945/ajcn.2008.27131.

[3] Ibid.

[4] "NTP Technical Report on the Toxicology and Carcinogenicity Studies of Sodium Nitrite (CAS NO. 7632-00-0) in F344/N Rats and B6C3F1 Mice (Drinking Water Studies)." National Toxicology Program, May 2001, ntp.niehs.nih.gov/ntp/htdocs/lt_rpts/tr495.pdf.

[5] Schwarcz, Joe. "Hazard and Risk: Carcinogens in Processed Meat." McGill.ca, McGill University, 20 Mar. 2017, www.mcgill.ca/oss/article/cancer-environment-health/hazard-and-risk.

[6] ClinicalTrials.gov, a database of privately and publicly funded clinical studies conducted around the world, which is maintained by the U.S. National Library of Medicine.

[7] Use of Celery Powder and Other Natural Sources of Nitrite as Curing Agents, askfsis.custhelp.com/app/answers/detail/a_id/1775/~/use-of-celery-powder-and-other-natural-sources-of-nitrite-as-curing-agents, accessed March 7, 2018.

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