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Upcoming Events

October 24 – 26, 2011

Grocery Innovations Canada
Toronto Congress Centre, Toronto, ON
www.groceryinnovations.com

November 1 – 4, 2011

**Process Expo:
The Global Food Equipment
& Technology Show**
McCormick Place, Chicago, IL
www.myprocessexpo.com

November 13 – 15, 2011

**Private Label Manufacturers
Association Show**
Rosemont Convention Centre,
Chicago, IL.
www.plma.com

November 15, 2011

**CIFST Toronto Supplier's
Night Table Top**
International Centre, Mississauga, ON
www.cifst.ca

In The News

Premium Brands Holdings Corp. announced in August that it has signed an agreement to purchase the assets and operating divisions of Piller Sausages & Delicatessens Ltd. (Waterloo, ON). Piller's is one of Canada's leading manufacturers of specialty European deli meats with annual sales of approximately \$180 million, and over 600 employees. Premium Brands owns a broad range of leading specialty food manufacturing and food distribution businesses across Canada.

THE MEAT OF IT:

NITRITES, WITH A PINCH OF CELERY

Today's meat processors fully understand the functional benefits and regulatory requirements of including nitrites in their cured meat formulations. Nitrates (saltpeter) have been used for food preservation for over 2000 years.

The largest accumulations of naturally occurring sodium nitrate are found in Chile and Peru, where nitrate salts are linked within mineral deposits called 'caliche ore'. Nitrite is the active meat-curing agent, and is converted from nitrate in the presence of bacteria (*micrococci* and *lactobacilli*). Nitrites provide cured meats with their distinctive flavour and colour, control the growth of harmful bacteria (*Clostridium botulinum*) that can cause botulism and have antioxidant benefits.

For cured meat products, the maximum input for sodium nitrite is 20 g per 100 kg of meat (200 ppm) (12 g per 100 kg for bacon), and the minimum level is 10 g per 100 kg of meat (100 ppm). Through the curing process, nitrites are effectively reduced to nitric oxide with the addition of curing accelerators, citric acid, ascorbic acid and sodium erythorbate. These functional additives result in significantly less residual nitrite in cured meat.

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FROM THE LAB

The Nitrite Effect

The characteristics expected of traditional cured meats such as reddish pink colour, distinct cure flavour and long term flavour protection are obtained through the addition of Nitrite.

Nitrite Input (ppm)	Effect in Meat Product
5 – 15	Some pink colour, which may be sporadic and will fade with time
40 – 50	Relatively stable cured colour and cured flavour
> 50	Antioxidant protection (reaction with heme proteins and metals to form nitros- and nitrosyl-compounds)
120 – 150	Effective control of <i>C. botulinum</i> , <i>L. monocytogenes</i> (dependent on pH, salt concentration, reductants and iron content of meat system)

Nitrite is depleted by about 50 – 65% during the heat process of manufacturing and is dependent upon the pH, heating temperature and the reducing agent (cure accelerator) used in the system.

Cure accelerators such as ascorbate, erythorbate and cherry powder increase the nitrite reaction to nitric oxide, hence reducing residual nitrite in the finished product. Nitric oxide/nitrous acid may be responsible for the inhibitory effect that nitrite exhibits against *C. botulinum* and *L. monocytogenes*.

When nitrite is fully depleted from cured meat, colour fading and flavour changes occur, and some residual nitrite is essential to maintain typical cured meat properties during extended storage, with 5 – 15 ppm of residual nitrite reported for commercial cured meats in US and Canada.



Comparison: Residual nitrites in traditional meat products and in products with cultured celery powder
(from the Malabar lab, August 2011)

Product	Method of Nitrite Addition	Residual Nitrite
Natural Wieners	Cultured celery powder	12 ppm
100% Beef Wieners	Sodium nitrite	10 ppm
“Uncured” Smoked Black Forest Ham	Cultured celery powder	8 ppm
Traditional Black Forest Ham	Sodium nitrite	3 ppm
Kolbassa	Sodium nitrite	3 ppm

Measurable residual nitrite concentrations in both types of cured products are often similar, without major differences in colour or colour stability. However, the shelf life of processed meats made with alternative nitrite sources is generally less than nitrite cured products due to the lack of other “traditional” ingredients such as phosphates, cure accelerators (ascorbate, erythorbate) as well as reduced initial nitrite input.

The information provided is accurate and reliable to the best of our knowledge, but is offered solely for consideration, without warranty or guarantee.

Regulatory Update

CFIA Meat Hygiene Manual of Procedures, Chapter 4, Annex C

C.2 Use of Nitrites in Prepared Meat Products

Cured Meat Products

Alternate Curing Method

Cultured celery powder may be used as an alternate source of nitrites in the production of cured or fermented meat products. Cultured celery powder contains preformed nitrites produced by the bacterial action on nitrates present in the celery product. The levels of preformed nitrites present in the celery powder must be declared by the manufacturer of the cultured celery powder. The producer of the meat product must determine the amount of cultured celery powder to be included in the formulation to achieve the minimum levels of nitrites (100 ppm, Meat Inspection Regulations, 1990) needed to cure the product without exceeding the maximum allowable limit (200 ppm, Food & Drug Regulations). This is an approved alternate curing method and the processed meat and poultry products cannot be referred to as “uncured” or “no preservatives added”.

The Push for More 'Natural' Meat Products

Over the past 15 years, the market for more natural processed meats has grown, with organic food sales in the US increasing by nearly 20% each year. Cured meats, as defined and regulated in the Meat Hygiene Manual of Procedures, must include sodium nitrite. While "uncured" natural and organic versions of traditional cured meats have become available, the bland taste and grey colour can be unpalatable for consumers.

Recently numerous scientific studies have been conducted in the search for other ingredients which can be used as substitutes for sodium nitrite, including beet juice, natural sea salt and celery juice. Natural occurring nitrates contained in these ingredients are relatively low based on their usage level in meats. (When analyzing the nitrate levels of celery, beet and spinach juice, it was noted that after 10 days of storage at room temperature, nitrate levels declined by 14 – 22%.)



A Pinch of Celery

There has been considerable research focused on celery juice powder as a natural nitrate source for meat products due to its light colour and mild flavour. To achieve a typical cured meat product, it was necessary to develop a functional nitrate-reducing bacterial culture (*Staphylococcus carnosus*) to reduce the natural nitrates contained in the concentrated celery powder to nitrites. An added incubation step is then required to allow the culture to perform the nitrate conversion, especially for smaller diameter sausages. A key variable is how to ensure a consistent level of nitrite to meet the required cured meat requirements of a



minimum 100 ppm. The antioxidant ability of the celery powder will also not be as effective as using sodium nitrite.

The New 'Cultured' Celery Powder

Recent developments have resulted in the introduction of a cultured celery powder, where the nitrates have already been pre-converted to nitrites, allowing for a stable and consistent nitrite input. This product is similar to the direct addition of sodium nitrite with a similar curing reaction and same process schedule (with no need to modify the smokehouse schedule). The approved label requirement is "cultured celery powder", which is often blended with sea salt and cane sugar for a consumer-friendly label. A consistent nitrite input of 110 ppm is possible, with the consideration that the cost will also be higher compared to sodium nitrite. The addition of natural antioxidants (rosemary extract), natural nitrite accelerators (acerola cherry powder) and natural antimicrobials (vinegar powder) will also provide improved flavour, facilitate nitrite reduction and provide additional protection.

Today's meat processor faces the daily challenge of producing safe and economical meat products that also meet the consumers request for natural, clean label foods. Novel research studies are ongoing in the testing and validation of natural ingredients that will meet these challenges.



For more information call us or visit our website – we can help!

Did You Know?

More than 85% of a person's daily intake of nitrite comes from nitrate in green, leafy vegetables or root vegetables including lettuce, spinach, beets, celery and carrots, and some drinking water. Only about 5% of a person's daily intake comes from cured meats. The nitrates found in these foods are converted to nitrite in the mouth, by bacteria in the saliva.

Vegetables are a well-known source of nitrate with concentrations as high as 1500 ppm to 3200 ppm (National Academy of Sciences, 1981) in celery, lettuce and beets.



Blends of the Season

Ingredients for a Cleaner Label



Celery Blend Plus # 6254

An economical blend of sea salt, dextrose, spice and cultured celery powder, for a consumer-friendly label. Celery powder provides a natural nitrite source to ensure the desired pink colour, and cured flavour, with an extended shelf life.

Celery Blend #2 (with cane sugar) # 6257

A blend of ingredients including cultured celery powder as a natural nitrite source, mixed with sea salt, organic cane sugar and spice. With usage at 2%, this blend provides a standardized input of 110 ppm of nitrite, along with a consumer-friendly label.

Acerola (Cherry) Powder # RA91046

Contains a high content of natural Vitamin C and functions in meat to reduce residual nitrite, enhance cured pink colour stability, and as an antioxidant. A natural alternative to ascorbic acid and sodium erythorbate.

Vinegar Powder # 7206

Concentrated free-flowing powder, with recommended usage at 0.8% for shelf-life extension and colour retention. Vinegar powder also delivers Alternative 2 status for ready-to-eat (RTE) meats, and may be added directly, or injected, with very low flavour contribution.

Green Pepper Extract # RA00682

Natural flavour enhancer for all fresh, cooked and cured meat and poultry products. Usage is only 2 – 4 g per kg of meat, so it's economical too.

*For more information on any of the above,
contact us at 1-888-456-6252, or
email csr@malabarspice.com.*



OUR PRESIDENT'S Message

The meat processing industry in Canada continues to evolve in its ongoing effort to stay competitive and profitable. Food safety concerns, increasing regulations, the trend towards cleaner labels, and global competition are issues faced by everyone in this industry on a daily basis. Sometimes however, in an effort to keep margins healthy, and to ensure our products appeal to the largest possible audience, the more authentic, interesting product lines are lost.

European deli meats, for example, are each unique in their quality seasonings and in the family recipes that have been used to make them over the years. While I understand how current trends can unintentionally result in the 'Canadianization' of product offerings, I mourn the loss of the more interesting and authentic meats. It may be that this trend will open up market opportunities for some processors to specialize in these ethnic products. Or, it may be that I will have to visit Germany more often in search of Thuringian Bloodsausage, the Nuremburg Bratwurst, and the Farmer's style Braunschweiger Liversausage.

All the best, from Malabar.

A handwritten signature in black ink that reads "D. Valade".

Doris Valade
President
Malabar Super Spice Co. Ltd.



For more information on any of the subjects covered in Malabar's newsletter, or to suggest topics you'd like to see covered in future editions, please contact Sara Alexander at marketing@malabarspice.com. Look for our next edition in Nov/Dec 2011.

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